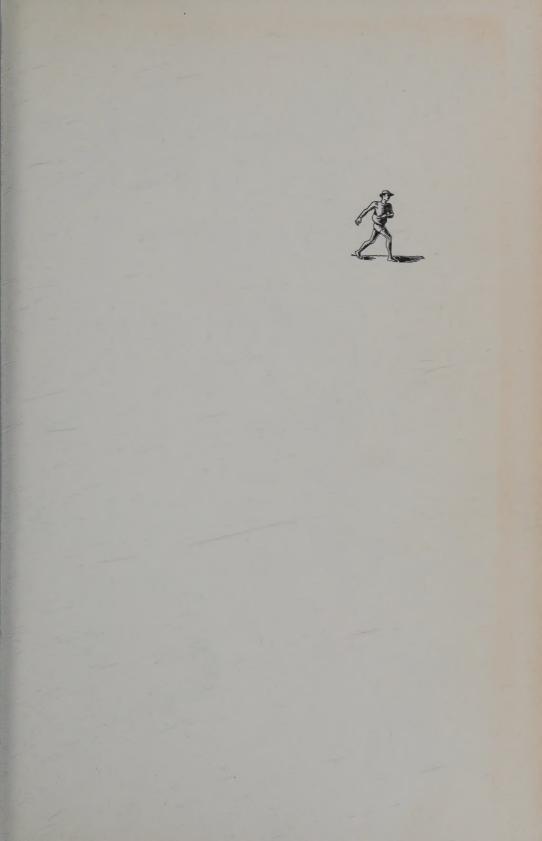
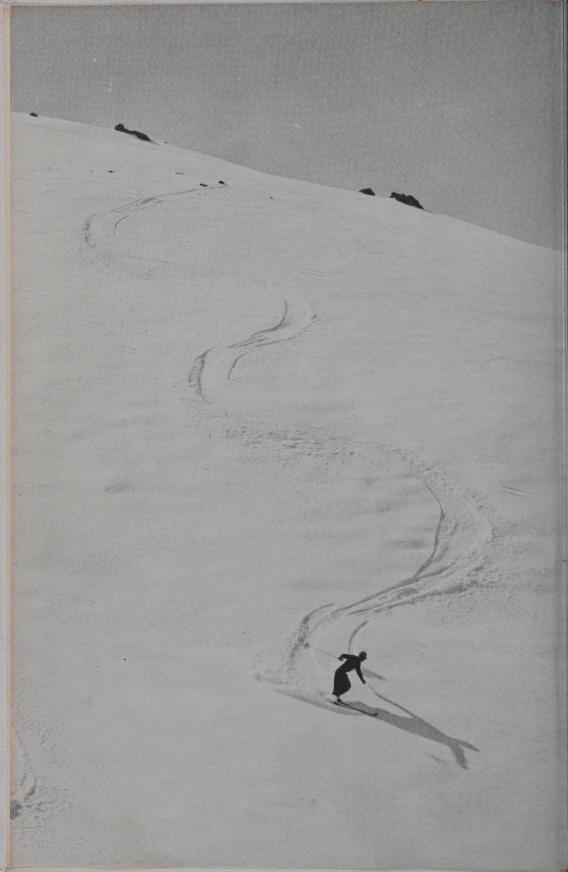


Marean Johnson





THE NEW INVITATION TO SKIING

by Fred Iselin and A. C. Spectorsky

with action photographs by
Lloyd Arnold,
"stop-action" robot photography by
Ferenc Berko,
drawings by
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To the men and women of the National Ski Patrol, whose selfless service has done so much for safe and happy skiing.

The authors wish to express their appreciation to the managements of Sun Valley, Idaho, and Aspen, Colorado, for making available the facilities of their resorts, where all action photographs were taken.

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SKIING isn't like any other sport. For one thing, it's fun while you learn, from the very beginning. For another, there are more misconceptions about it than about any other outdoor activity.

Skiing is dangerous, you hear. Not as dangerous as swimming, any skier will tell you, because when you fall down in snow you don't drown. Not as dangerous as horseback riding — you don't have so far to fall. Not as painful as falling on ice while skating.

Skiing can be very dangerous, however. It is dangerous when one skis out of control, riding the skis like a sled that can't be turned or stopped. It is just that kind of skiing we want you to avoid.*

The purpose of this book is to teach you to ski for fun, with grace and ease, and always under control, able to stop when you want to, turn away from obstacles, reduce or increase speed at will. This is the art of skiing; it has greater thrills and exhilaration than any other sport known to man. And it is not hard to learn. When you consider that the average novice in skiing is able to devote only about twenty days to the sport in one season, and those days often not consecutively, but in two-day weekends, it becomes apparent that the acquiring of reasonable skill, which is often achieved in the first season, puts skiing in the forefront of sports relatively easy to learn. Yet one can devote an entire lifetime (and a happy

^{*}High-speed skiing and competitive skiing are hazardous in much the same way that automobile driving is. A fall at high speed on skis may result in a broken bone, since the leverage of the skis puts a powerful twist on the ankle, knee, and leg. However, safe skiers, like safe drivers, have much less to fear than the man who is always striving for top speed from his car or his skis.

one!) to developing and improving, to learning refinements and achieving grace. None of the learning process need be drudgery, either, if a sensible, intelligently worked out and tested system is pursued.

Another misconception about skiing is that one must be young and strong to enjoy it. Yet people in their forties and fifties have taken up the sport for the first time — and are still enjoying it at sixty and over. They are not and they never will be winners of skijump and racing competitions, but at all the snow resorts of the country you can see them skimming down slopes in easy, sweeping turns.

One reason skiing has had a "scare" press is its comparative newness in America. Most of us think of this sport in terms of the newsreels we have seen of competitive races and jumps. One might as well base his conception of swimming on high-dive competitions and cross-channel swims. But the newness of skiing has one great advantage for the beginner. He is not alone. And the joy of skiing, its ability to uplift the spirit and excite the mind, its surroundings of white mountains and sparkling air, have made skiers respond with an inner wholesomeness which takes the form of benign and friendly interest in the beginner. He is never laughed at, never derided. Skiers are a clan of gentlepeople, eager to help, eager to encourage.

Now is the time to start being a skier. Now, when trains and planes can take you swiftly and inexpensively to the many fine new ski areas being developed north of the snow line and all across the country. Learning to ski is a voyage of exciting discovery; it will open a new world for you in the way of fun, health, excitement, camaraderie and the joy of living.

But how to learn, you may ask. Isn't it difficult? Doesn't it take a long time? The answer is a loud and hearty no. There are three ways to learn. One is to get on skis and ride. You may develop balance and a certain amount of zip and speed this way, but you're more likely to end up in the hospital. Even if you don't, you'll be a constant hazard to other skiers and to yourself. You'll compare with real skiers as a man who can go fast in one direction on skates compares with a figure skater cutting beautiful patterns on the ice to the admiration of all who look on.

The second way to learn to ski is any one of a number of "quick,

easy shortcuts" which offer to teach you without any trouble in a miraculously short time. If you learn that way, you'll be able to perform creditably on slopes of the "correct" gradient, on snow packed just right and of a certain consistency, and, preferably, on the slope on which you received your instruction. But nothing will help you if you get into deep snow; you'll start to turn in your usual way and, to your surprise, you'll keep going straight—if you're lucky. More likely, you will finish the hill on your face, a method of skiing which, experience teaches, is neither pleasant nor elegant.

The third way is the right way: Select a recognized and reputable system of skiing founded on a sound knowledge of the skier's art, and follow it diligently, through a logical, step-by-step method of instruction. Experience has shown that this is, actually, the quickest way to become a real skier. And, incidentally, avail yourself of as much on-the-snow instruction from qualified teachers as it is in your power to obtain.

We believe that in this book you will find a system of self-instruction ideally suited to American skiing. It is based on a method of skiing known as the Arlberg Method, which was developed by Hannes Schneider, the father of modern skiing. It is no mystery why the Arlberg Method (or Technique, or system) is considered best by the large majority of experts and teachers. It has a simple, classic logic. You can start with the elementary maneuver in skiing—the straight run down a gentle hill—and follow through to the most advanced one—the high-speed tempo turn—by an orderly progression of simple steps. Or, working the other way, you can analyze the elements of the tempo turn and see that every single step in the Arlberg progression comes into play and that each follows logically from the one before it and is essential to the mastering of the one after it.

We emphasized the word "based" in saying the system of instruction in this book is based on the Arlberg Method, because you will find here a modern modification of the older Arlberg teaching technique. It is perfectly adapted to modern American skiing, which is mostly noncompetitive downhill skiing on open slopes, but its special excellence lies in two unique qualities: (1) The movements of high-speed, expert skiing are taught from the beginning at slow speeds within the powers of the novice — as a result,

there is no waste motion, no learning of exercises later to be abandoned; and (2) although the present method was modified to meet the requirements of open-slope, downhill skiing, it is basically a sound method, so that those who learn by it can cope with all snow conditions and all types of skiing, including the running of trails. It may look funny to see a person used to packed slopes floundering in powder snow, but to him it is a real tragedy to discover that he must begin all over again.

The purpose of this book is to spare you such unhappiness. There is only one kind of good skiing: the kind that can cope with whatever conditions may be encountered. Even if you use this book to learn skiing on packed slopes, you will be capable of dealing with deep, untracked snow when you meet it. It is easier to ski on the packed slope, and it is a temptation to learn a short-cut type of skiing for use on it, but he who learns correctly will be amply repaid on all slopes.

One word of caution, which can not be too strongly emphasized: If you are a beginner, stick to one reputable, recognized school of instruction. If it is Arlberg, stick to that. If it is Swiss, stick to that. Confusion, misery, and defeat are the lot of the bewildered beginner lost in a maze of systems. All systems have as their goal controlled, easy skiing; their major differences lie in the manner in which they approach their common aim.

We have no intention of detracting from any system of instruction. Fine and able teachers of all recognized schools can point with pride to pupils who place high in competitive skiing. We do believe that the modified Arlberg system is the surest, simplest, most logical, and most easily understood method so far developed. It is a joy to the teacher to see how the pupil unconsciously and automatically brings into play in advanced work the essential elements learned on his first day on the practice slope. You can go from novice to expert by a blended progression which is as smooth and pleasurable as the polished ski runs you can soon be making.

WHY FORM?

Technique, form, is the mark of the expert, whether he be golfer, pianist, boxer, or skier. Why is this? Because form is the execution of any physical activity with maximum efficiency and minimum

effort. We find good form beautiful, aesthetically satisfying, because it is functional and therefore graceful. Physical grace is the handmaid of physical efficiency. The back-swing and follow-through which characterize the drive of the championship tennis player and golfer can be seen, on a smaller scale, in the hand movements of the concert pianist and in the shoulder movements of the great skier. Form — that is, good technique — is not an added quantity it would be nice to learn while becoming a skier; it is an integral part of the sport, of any sport. And it pays amazing dividends.

In skiing, the most advanced and most respected and admired maneuver — the tempo turn — is the easiest to do in terms of muscular effort. It is the ultimate in technique, and therefore the ultimate in efficiency. For the same reason, it is a beautiful sight. Every exercise, movement, and maneuver in this book will lead you to it, gradually. Every link in the learning chain will play its part in the final perfection of your form. We urge you not to skip the seemingly unimportant earlier exercises necessary to mastery. They will make of you a skier whose form is impeccable, whose skiing will light the eyes of the beholder, and fill you with a joy and excitement impossible to describe. You will experience the true thrill of the sport: you, alone, on your skis, at the top of a snowclad mountain, looking out over distant ranges, then looking down at a steep run, a grove of trees to be threaded, a winding trail, a massive rock formation to be circled, whatever the terrain offers and knowing you are the master of it. That's skiing!

RETROSPECT AND PREDICTION

The foregoing paragraphs were written "on the scene," at Sun Valley, some twelve years ago. The authors see no reason to modify them in any way.

To be sure, a great deal has happened to skiing in those years. New areas have been opened up, many thousands of new skiers have become expert devotees of the sport, there have been vast improvements in equipment — notably the perfection of the safety binding. There have also been fads and fancies in methodology — in teaching and in technique. We have watched them come (and go) with interest; they are discussed later on in this book. Here let

it suffice to say that from the vantage of twelve years — years during which skiing in America has grown fabulously — and the general level of skill has improved immensely — we see no reason whatever to change what has been said in this book about the means whereby skiing mastery may be achieved. There are in skiing, as in every sport, individual stylists and brilliant iconoclasts who develop their own excellent techniques. Frequently, there are elements in these individual styles and techniques which can be imparted to others — to their benefit. It is equally true to state that some of these benefits are or may be booby traps; that is, final mastery is sacrificed for a rapid rise to intermediate status or to a flashy but limited repertory of tricky turns.

For the fact remains that in those twelve years, American skiing — for recreation, as well as in national and international competition — has improved immeasurably through application in skiing and teaching of the modern, modified Arlberg technique, sporadic shifts to other systems hither and you to the contrary notwithstanding (and often, if the pun may be forgiven, withfalling).

No system, of course, is perfect, and the dinosaur attests to the inevitable mortality inherent in nonmodification. For twelve years we have read about and observed on slopes all over the world, with open minds, whatever seemed new and promising in skiing. We are open-minded and the methodology we recommend is "open-ended" — that is, it is not sealed off from further modification. But in those years we have seen nothing to suggest any radical revision of technique (though readers of the original volume will detect some slight alterations in this one, which are additions, not changes). On the contrary, continued experience points to the classical Arlberg Method (as modified in these pages) as the key to the art of skiing.

We welcome experiment and applaud progress. It is our belief that the skier's art will continue to improve. But skiing — like piano playing or touch typing — imposes its own discipline by the nature of its tools and the human anatomy which wields them. And the core of that discipline is Arlberg.

CHAPTER I

Preliminaries

HOW TO USE THIS BOOK

Three things are essential to learning the art of skiing correctly: practice, patience, understanding.

The practice may be hard to come by; not all of us can ski as much as we would like to, and the weekend skier is too often tempted to have fun while he can with the little he knows, rather than devote himself to perfecting his technique. Such people, and those who have gone through the so-called short-cut courses of instruction, are what we call "stopped skiers"; that is, they have progressed to a certain degree and there they stay. They're missing most of the fun. Practice in skiing pays dividends fast, in progress and enjoyment. So, follow the instructions in this book carefully, and don't go beyond any step until you have fully mastered it. Even then, a half-hour warmup on each skiing day, in which you go through the elementary maneuvers again, is extremely valuable.

Patience is a virtue which no one can teach you. But remember this: It is in the five minutes after you feel like giving up that things suddenly come right and you do with ease what seemed beyond your ability to learn.

Understanding the principles, dynamics, movements (and reasons for them) in all the skiing maneuvers is necessary to their learning and correct execution. Read the explanations step by step; consult the diagrams often; as you read in your room, stand up and "sense" the movements described.

If you feel you want to, you can skip the chapters on equipment, conditioning exercises, a typical downhill run, the use of tows, com-

petitive skiing, and several other parts of the book which are not absolutely essential. But don't gloss over or skip the earlier chapters for the later, more spectacular ones, even if you consider yourself something of a skier already. If you do, you will become a "stopped skier."

A word about the photographs in this book. If you want flashy action shots with a plume of powder snow and a skier whizzing down a seemingly perpendicular slope, go to your travel agent or a newsreel theater. The pictures included here are chosen for their clarity. Study the position of feet, skis, body, knees, shoulders, arms, and head. Look at the pictures marked "wrong," as well as those marked "right." The most typical faults of beginners are shown. Are you guilty of them? If so, you will find the cause and cure in the text.

Above all, do not ignore the "do's" and "don'ts" at the end of each chapter. They represent a synthesis of many years of experience in teaching all kinds of pupils, from rank amateur to near-expert, and include not only a recapitulation of important points explained in the text but also additional "ounces of prevention" to keep you from falling into errors which would prove hard to cure.

And now, Ski Heil! You're off on your way to mastery of the world's most thrilling and inspiring sport. Work hard at it — and good skiing!

EQUIPMENT

There are dry-run skiers, just as there are dry-run sailors, fishermen, amateur photographers. These are usually gadget-happy types who are more interested in the gear of the sport than in the sport itself. Usually, these "experts" are full of advice on what is the latest and best in equipment; usually, they are constantly adding to their gear and rejecting last year's favorite acquisitions. You can't become a sportsman by buying, but these characters try to do so and are constantly disappointed at their failure, which they blame on their guiltless purchases. In recent years, the development of many kinds and types of ski equipment has made ski-gear buying a full-time occupation for the dry-run folk. We give them this much space, here, so you'll recognize them when you see them. That's important if you're new to skiing and are out to equip yourself — learn to spot the so-called expert and run away from him just as fast as you can. He can talk you into spending

too much money, into buying dubious gadgetry, and into thinking it costs hundreds of dollars to get equipped for a snow-bunny weekend. Not so, not so — as we shall see.

Skiing need not be an expensive sport. Wisely purchased equipment, selected for excellence of materials and workmanship rather than for looks, is now widely available and, given proper care, will last many seasons and in most cases many years. Bearing this in mind, don't practice false economy. The difference between a thirty-dollar pair of adequate boots and a fifty-dollar pair of better boots, prorated over say five years, is just four dollars a year; the difference between the two in happy skiing may be immeasurable.

And don't get buyer's fever; take your time, shop, compare, think over a purchase before you make it. Increasingly, equipment is available for rent at the ski slopes. We do not recommend relying on rental; equipment used and misused by others is never as satisfactory as that which you own; but rental can offer you an opportunity to try out equipment about which you may be in doubt. The rapid growth of skiing has been accompanied by a proliferation of equipment, not all of it good. If you're in doubt about any of it which you're considering buying, a rental pre-purchase trial may help you to decide.

Here is the recommended order in which to spend your money and invest your best judgment when buying ski gear: Do not stint on boots and bindings. They are the most important part of your outfit, since an absolutely firm juncture of boot and ski is essential, and since every foot and body movement must be transmitted to the ski. Skis and poles come next, then ski pants, underwear, socks, gloves or mittens, sweaters, knapsack, and various trimmings of real or fancied usefulness come last.

BOOTS

Ski boots are of many types (some of which are shown in Figures 1, 1A and 1B) but they must all measure up to the same set of qualifications if they are going to do their job well. A good ski boot has a thick sole (usually steel-shanked), a properly grooved heel to take the rear part of the ski binding, and uppers of stout yet pliable leather. Boots must fit snugly. If they are too tight, they will be useless, but if they fit loosely, they will not afford the kind of control required in skiing,



Figure 1 — BOOTS. Left, the Henke "Speedfit" has rapid clip closure, stiffening stays in pockets on outside of upper, excellent padding. Right, the Peter Limmer boot has generous padding, an excellent, integral inner boot.

Figure 1A – Two boots of fine workmanship, each with a sturdy yet pliant inner boot, are (left) the Haderer "Olympia," and (right) the Strolz "Cortina."





Figure 1B — Three fine boots of excellent material and workmanship but not in the highest price bracket are (top) Garmisch, (left) the Henke "Slalom," and (right) the Nordica "Sestriere." All three have inner boots.

where every movement of the foot must be communicated to the ski without lost motion inside an ill-fitting boot.

When buying boots, take along your own socks. Stores supply a sock for trying on boots, but your own socks, which fit your feet, are necessary for you to be certain of correct fit. Put on a pair of lightweight wool socks and over them a pair of heavy, raw-wool, outer socks. Grasp the tips of both socks together and pull them free of your toes, so that the inside sock will not cramp the foot. Try to ease your foot into the new boot without letting the friction pull the toes of the socks up tight. Before lacing the boot, kick the heel against the floor, so that the foot is well back against the heel of the boot.

Now lace the boot firmly, keeping the tongue unwrinkled and straight. The laced edges of the uppers should not close or come closer than a finger's width to each other; if they do, the uppers may stretch enough to prevent a tight lacing. If the laced edges are too far apart, snow may penetrate the boot, and the laces may cut the instep.

With the boot laced up, stand squarely on the floor and try to wriggle your toes. They should not feel cramped, but they must not have free play inside the boot. A snug, comfortable fit is desirable. Now start to rise on your toes. Your heel should not come up off the sole of the boot. Now bend your knees and lean forward from the ankles, keeping your heels on the floor. The boot top should not cut into the front of your ankle.

If the boot is all right in the above respects, and if it is made by a reliable craftsman, you can now pay attention to its cosmetic aspects, but don't let looks influence you before the boot proves itself functionally.

There are over a hundred makes and types of ski boot on the market today. Most of the good modern boots have the following four features in their favor:

- 1. Availability in various widths and lasts, as well as in length sizes, thus assuring you of correct fit.
- 2. An inner boot, pliable and often padded, which can give the ankle good support without constricting the entire foot.
- 3. Comparative lightness. A sturdy boot need not be a clumsy one; steel shank in the sole and good leather with lightweight padding combine to make a boot which won't retard climbing or make you look like a deep-sea diver.
- 4. Soft enough leather in the uppers so that boot can lace fairly high yet not inhibit bending at ankles.

What should a boot cost? It depends on your finances and the kind of skiing you do. For the occasional-weekend skier, \$25 to \$30 should be adequate. For the average recreational skier who gets out more often, and for longer periods, \$40 to \$50 will do it nicely. Experts and competition skiers will not be likely to be seeking advice here; however, should you wish to equip yourself with boots as they do, \$60 on up will do the trick — and may your skiing be as good as your boots!

Says Spectorsky: "As an occasional skier lo these many years, I like the fact that the new, better boots don't require too much breaking in. The foam or sponge padding aids a lot in comfort and support

for the feet of the normally sedentary. As a man with a long foot, I'm delighted by the narrower soles of the newer boots, which don't overlap the sides of the skis the way the older, wider soles did."

Says Iselin: "Out on the slopes all day, standing while teaching, and skiing, day after day, I've had plenty of opportunity to evaluate the newer boots. They are definitely superior to what was available ten years or more ago. I've also seen every degree of amateur skier and have talked to dozens of competition skiers, teachers, coaches, Olympic skiers, all over the world. In discussing recommendations with my co-author, we decided it would be better to name names — and risk hurt feelings about unfair omissions — than to withhold the fruits of experience."

Well, then. The major bootmakers have various styles and models, with new models appearing virtually every year. Those bearing the following names are deemed especially worthy of your consideration: Haderer, Strolz, Rogg, and Henke for the expert and for downhill and slalom; Garmisch and Nordica for a somewhat less costly boot. Other excellent boots include Strasser, Kastinger, Humanic, Raichle, Rieker, Molitor, Bass, Le Trappeur, Dolomite, Sandler. This is not an exhaustive list by far, but it's a fine starter; chances are you'll find fit and price to suit you and your skiing among the boots bearing these names.

Boot development is not standing still, however, and if you have the time, the pelf, and the inclination, you might want to try some of the innovations, such as the boot with air cells and a squeeze-bulb pump: you lace up the boot, then inflate the cells to attain the desired tightness without any pressure on bony bumps or sore spots. Or, there's a boot with oil-filled uppers which conform to foot contour when tightened. Henke has two interesting boots — both use-tested: The "Speedfit" closes with clamps (somewhat like the old galoshes) and has a self-closing inner boot; even with a gloved hand you can loosen these boots while resting or riding a lift, then snap them tight in a jiffy. The other is the Henke "Slalom," with uppers cut and stitched in two separate parts, to permit a hinge action for extreme forward lean.

As we said, in buying boots — as well as all equipment — take your time. Be sure of fit, be sure of adequate support, don't go by looks. Finally, don't expect your boots to be completely waterproof; they should be snowproof, but if they were waterproof your feet would

perspire and the perspiration might freeze. The result is not fun. It is hard to ski with a few toes missing.

BINDINGS

The function of the ski binding is to hold the boots rigidly to the skis. Just as it is up to the boot to hold the foot firmly enough to reflect every motion of the body (transmitted through legs and feet) to the binding, so the binding must continue this transmission of forces to the ski. A wobbly, infirm binding, with "play" in it, defeats controlled skiing.

A decade ago, the lethal aspects of the rigid binding were accepted as one of the hazards of the sport. Torques and strains resulting from spills pitted the whole leverage of the ski against human bone and sinew. The binding held the skier to the lever and it was the skier's anatomy that lost the unequal struggle. There were, to be sure, a few safety devices designed to release the grip of the binding on the boot under too great stress, but they were at best tricky, intricate and unreliable; at the worst, they popped open in mid-turn while the skier was "swinging," or they failed altogether in their function of holding the boot rigidly to the ski.

Then a major revolution took place. Inventive gadgeteers, spurred by the growth of the sport and the emphasis on high-speed downhill skiing (and the increase in fractures), set to work to perfect a binding which would hold as effectively as any non-safety binding ever devised, but which would release its grip before endangering its wearer.

It would be foolish to predict that no further improvement in bindings will be forthcoming. But it can be said with certainty that the best modern safety bindings do their jobs superbly. And they have won a psychological as well as a physical victory. When they first made their appearances on the slopes, the experts ignored them and the show-off hot shots sneered at them as sissy stuff, comparable to water wings for swimmers, fit only for beginners. Now every skier with common sense and the desire to keep skiing uses nothing else. Even in the toughest competition skiing, the safety binding is used virtually exclusively. And speaking of psychology — what greater tonic for the beginner's mental attitude could there be than the feeling of security to be derived from safety bindings.

But this brings us to an urgent note of warning. The safety binding *must* be affixed to the ski, and adjusted to the skier's boots, by a qualified expert. Its release point — the setting of its safety action — must be regulated by an expert. Learn from him how to adjust it and check it, then do so frequently. Otherwise, your serene sense of security may be shattered most rudely by the sound of a bone cracking!

Are safety bindings really safe? Consider this statistic: In the 1957–58 season at a Western resort known for its steep runs, out of twenty-six thousand pupils there were only ten fractures; of those who suffered them, six wore non-safety bindings. Automobile driving should be that safe!

A couple of paragraphs back, we warned about the necessity for correct mounting and adjustment of safety bindings. That is important, but one should not be misled into thinking these bindings are complex or fragile, or that they require constant tinkering. It's only good sense to check all your gear before you take off, anyway. Learn how to check the adjustment of your bindings, and they'll give you rugged and dependable service plus that confidence which is so important to rapid progress. Incidentally, don't get the impression that the more expert you get, the stiffer the release mechanism will be, or should be, set. If you ski technically correctly, the binding can be set very "loose" even for high-speed skiing.

Safety bindings are of two major types: heel tight and heel free. Both do their jobs and there is much controversy over which is the better. Far be it from us to take sides; a pretty good guide to the kind you should select is to observe which is favored by the better skiers and the instructors in the terrain where you'll do most of your skiing, because the chances are that terrain and kind of skiing have influenced the relative popularity of the two kinds of bindings. In either case, the release of heel or toe frees the entire boot. One governing consideration: If you plan to do any touring, or much walking about on your skis, you'll probably select a heel-free binding. Either style is suitable for all snow conditions. For a representative selection of safety bindings, see Figure 2.

A final caveat before we get to actual makes of bindings: A released ski will run away from you unless it's tethered to your boot in some way; a long strap is not recommended (although these are sold) because in a bad fall the ski may windmill around the skier and cut or gouge him. We advocate the Arlberg Safety strap, or one similar to it.



Figure 2 — SAFETY BINDINGS. Among the many excellently constructed and designed safety bindings and binding elements are those shown here. Front row, left, Ski Free toe iron; right, Marker "Automatic" toe iron. Mounted bindings are, left to right, Attenhofer Safety Flex, Cubco, Tyrolia.

Many experts and instructors who have experimented with safety bindings have found they prefer to create their own combinations of heel and toe devices. We see no reason why the amateur and beginner should not profit from this, and our recommendations, which follow, indicate such combinations when they're deemed desirable. Once more apologizing for omissions, we list our choices here, with a few comments on each.

A fine choice for all-round skiing is the combination of the Marker Head binding with Attenhofer Safety Flex cable. The complete safety binding made by Dovre is also excellent.

If you plan no touring on your ski trips, an excellent binding is the Marker Swivel Longthong. An alternative, with similar design, is the Anderson & Thompson. Both do a fine job of providing safety while holding the heel down firmly to the skis, essential in modern, high-speed skiing. These bindings can even be used for jumping, a particularly grueling test of strength and design.

For the recreational skier, the U. S. Star provides a simple, easily adjusted mechanism with a positive release. Its unsuitability for touring is the only thing which keeps it from being designated all-purpose.

For economy and good design, we suggest the Ski Free combined with Attenhofer Safety Flex cable, a combination which is hard to beat for virtually any condition of skiing or degree of skier's skill. One of the simplest safety bindings in design, and one of the easiest to get in and out of, is the Cubco — a very popular style in the Midwest. Except for touring, it does a fine all-round job.

The Tyrolia is an excellent binding for all forms of skiing, including touring, as is the Dovre, which operates on much the same design principle. Their versatility is bought at the expense of simplicity; adjustment is not quite so simple as with some others, but it is readily learned — and worth it.

There are some dozen or more other bindings available which do their work excellently; the foregoing were named to provide guidance, not to discriminate against all others.

Your bindings, like your boots, can last a long time and can "graduate" from one pair of skis to another. Bindings range in price from about ten dollars up.

SKIS

In the technological revolution which has so radically affected ski gear in the past dozen years, the evolution of the skis themselves is as remarkable as the development of the safety binding. A dozen years ago, the industry standard and the preferred ski of the experts was solid hickory. Cheaper skis (then considered adequate for the beginner) were made of maple and ash. Although steel edges were worn by most skiers, especially on packed slopes, and by all experts, almost half the skis sold relied on the wood itself for bite and control in turns, or had the edges mounted after purchase.* In those days, when the authors were at work on the manuscript of the old *Invitation to Skiing*,

^{*} This is extraordinary, for steel edges were used in slalom competition in 1926, at Davos. In a field of some eighty skiers, the Lantschner brothers, from Innsbruck, proved unbeatable. Later it was discovered that a man named Lettner had secretly installed the clumsy prototypes of today's Lettner edge (which consists of interlocking short sections) on the Lantschners' skis, and a great howl of foul play went up from the other competitors; but the jury ruled in favor of the brothers, and the edge became standard in competition very quickly. Lettner had neglected to patent his edges, and imitations and modifications were and are numerous. Interlocking edges, one-piece edges, side-mounted, flush-mounted, angle-mounted, offset-mounted — all had their innings and still do. In the gabfests of ski lodges all over the world, experts fight the battle of the edge year round. The amateur's best bet is to entrust the choice of edge to the manufacturer of his ski — a wise course if for no other reason than that skis come equipped with these edges anyway.

we were testing on the slopes at Sun Valley a variety of "new" skis — laminates, metal, combination metal and wood, etc. — but at that time the hickory ski was still deemed the best and most reliable.

All this is changed. The skier's concern about matched skis of equal camber (the bowed springiness of the skis), about straight grain, about the dangers of warping and twisting, about the right kind of press to retain ski shape, is no more. All the features which used to distinguish a good ski are still desirable; there has been no change in aim or in basic functional design; but they can all be had now in skis which are uniformly excellent, retain their shape and camber, do not vary from ski to ski or from pair to pair, and can be depended upon to serve with a minimum of care and upkeep. Today, when you set out to buy a pair of skis, you can feel confident that "lemons" are rare, and that most of the better-known makes of moderately priced skis (on up) will be superior in performance and durability to the best that was available a decade ago.

But how to select your skis from the bewildering variety that you are offered? It's a tough question, to which two "don'ts" may prove better guides than any positive advice. First, don't select your skis by looks. Skis come in as many colors as cars — including two-tone and three-tone. If you like color, let it be the last consideration in your purchase. Next, beware of fads. Skiers — on the whole an independent and clear-sighted fraternity — are sheeplike in this respect. Whenever a championship is won on a particular make of ski, its sales soar, as though the inanimate ski were a magic talisman for assuring good skiing. Then another champion comes along, with different skis, and last year's favorite becomes this year's also-ran. Certainly the ski selections of winning competition skiers are a legitimate guide to excellence; just as surely, last year's winning skis — and next year's — are as good as this year's, especially for the noncompetitive skier.

Once certain that you are in a reputable shop where only excellent merchandise is carried, the suitability of a pair of skis to you is of greater importance than the brand name it carries. But since all the best brands come in a variety of lengths and stiffness (the two principal considerations in selecting the right skis for you), we recommend restricting your shopping to the better-known, use-tested-by-experts brands. Some of the finest are pictured in Figure 3A.

Length is the first consideration in buying skis, once you've satisfied yourself about quality. Figure 3B shows the correct way to measure

skis. Standing normally erect, raise the arm comfortably; the ski, with its heel on the floor and held vertically, should have its tip reach the palm. Novices sometimes make the mistake of thinking shorter skis will be easier to maneuver, a belief which is fostered by their initial difficulty with the kick turn. Don't be misled; too short skis are less stable than the proper length and will be unequal to the demands of the dynamics of turning, sideslipping, and stopping. Alternatively, skis which are too long will be hard to control, especially in tight turns. The beginner may find a slightly short ski somewhat easier to learn on; if

Figure 3A — SKIS. Seven top makes of skis constructed with the best of materials and fine workmanship are, left to right, the Head "Standard," Cortina, Kästle, Blizzard, Northland "Competition Downhill," Rossignol "Easyflex," and Hart.



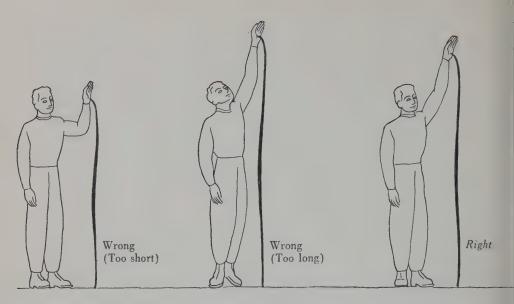


Figure 3B — HOW TO MEASURE SKIS.

you're buying with this in mind, select the length which reaches to the base of the thumb — no shorter.

When you hold a pair of skis with their running surfaces together, you will note that the heels and the start of the upturn at the tips touch, and that the rest of the skis curve out from each other, with the greatest separation at the point where the platforms for the ski bindings are located. This curvature is designed so that when you stand on the skis they will flatten out and distribute your weight along the entire running surface. If the springiness of this camber is too strong for your weight, the heels and tips of the skis will dig into the snow. If the skis are too limber for you, the midsection will sag and bear all your weight. Do not mistake stiffness in the ski for strong camber. Even the springiest skis, for very heavy people, must be flexible. Similarly, do not mistake a soft and lifeless ski for one of light springiness. A ski should feel live and flexible in your hands when you bend it.

The most common error in buying skis is to buy a pair which has too strong a camber, so that the skier's weight does not flatten out the curve and get the whole ski on the snow. It is better to have too little camber than too much. Put both skis on the floor and stand on the platforms where the bindings will go. You should not be able to insert a card or piece of paper under the ski at any point behind the upturn

at the tip. Remember, if your skis have too much camber they will dig in at tips and tails, and you will be unable to maneuver.

Unless there's a special reason for it, avoid the purchase of specialpurpose skis. Jumping skis, with their great length and triple grooves, have no place on the ski slope. The very light, unedged and narrow cross-country ski is suitable only for cross-country running. The specialized slalom racer's ski, while it is highly maneuverable, is not too good for all-purpose and recreational skiing. Its offset edges may protrude abnormally far and can trip the recreational skier, and although their soft steel can be (and is) honed to razor sharpness for competition, it loses its keenness quickly and requires constant resharpening. Your best bet is the highly maneuverable regular slalom ski, or the combination downhill and slalom. On the best of these, the steel edges are hard enough to hold their keenness and are sharp enough, and yet they are not so hard as to diminish the ski's natural flexibility. The edge offset is slight. Avoid the specialized downhill ski; it tends to be stiffer and harder to turn. A rough-and-ready rule for determining ski flexibility that's right for you: For girls and smaller men (up to 125 pounds) try the "soft" grade first; men up to 180 pounds should do well with the "medium" grade; heavier men will require a harder grade. Give consideration, too, to the kind of snow conditions you'll be most likely to encounter. The deeper and softer the snow, the more flexible and soft the ski should be, and vice versa.

Virtually all skis made these days are sold with a bottom finish already applied. For a discussion of these finishes, see the section in this chapter called "Lacquers and Waxes."

And now to our specific recommendations — again, with the understanding that this listing is selective and not exhaustive, and that many fine skis are not named.

Irrespective of cost, Head skis may well be considered first choice for American skiing. Developed and manufactured in this country, constantly tested, they are superb precision devices, making use of metal, plastic and wood in a virtually indestructible combination. The Head Standard is recommended for every kind of recreational skiing. Head Masters are heavier and are much favored by downhill racers. *

^{*} As we go to press, Head is testing (Model X-37) a radically different skibottom design, with a running surface which is not plastic, but rather an aluminum-oxide film known as "Hardcoat." The result is an extremely fast ski for downhill racing.

Northland is another domestic manufacturer of fine skis, available in a variety of models, from inexpensive on up. Even their most expensive ski is not out of range for the average recreational skier. Northlands are the biggest sellers in the United States.

Blizzard skis are high rankers in the higher-priced lines, as are Kästles. The latter are favorites with what may be a majority of racers. These skis feature a very limber forward section and tip, with greater stiffness from the binding back; many experts believe this makes for greater speed, especially in schusses with the weight a bit back. Cortina skis are excellent, have such refinements as rubber snubbers on the heel armoring.

Rossignol is a beautiful ski, perhaps the best of the all-wood skis made. It is not inexpensive, but if price is not too important a factor you should at least examine a pair of these.

Other excellent skis are made by Fischer, Erbacher, Hart, Gresvig, Eriksen, Kneissl, Authier, Rosskopf, and others.

A good pair of skis can be yours for \$40 on up, though adequate, less expensive skis are available — as are superb skis costing more than twice as much. Since modern skis are so durable and trouble-free, a largish investment in them is more justified than it would have been years ago when skis required far more frequent replacement than they do today.

POLES

The vogue for short poles is obsolete, and a good thing, too. They were inadequate for balance, timing, climbing. The vogue for too-long poles is also passed — an equally good thing. This short-lived vogue resulted from the fact that some skiers, observing the success of slalom racers who had abandoned the short pole for a longer one, assumed that you can't have too much of a good thing and began using poles reaching to their shoulders and even higher.

Today, the pendulum swing from too long (back in the twenties), to too short, to too long again is thankfully over. A good pole length for modern skiing is to have the top of the hand grip rest easily an inch or two below the armpit when the point is on the floor. This will give

the skier poles which are long enough to aid in balance, and which will help him attain rhythm ("touch-and-go" is how skiers describe the rhythmical use of poles in turning).

The preferred all-purpose pole you select will probably be steel. It is extremely strong, light enough, almost unbreakable (and if it does break, it usually breaks clean), and won't bend as some aluminum poles may do. Glass poles, like glass fishing rods, are now popular, though some makes tend to be heavier than steel of equal length and strength. Cane and taped bamboo are enjoying a degree of popularity, too, but they have drawbacks which include a tendency to splinter if they break and less durability than metal or glass. Virtually all types of poles are available in a variety of colors; the glass poles in black, with white grips, look very elegant. Naturally, color should be the last consideration — after one is sure of a pole's functional and structural virtues.

Grips are very important. They should be sufficiently thick to afford good padding and should not tend to slip from the gloved hand when wet. Plastic may slip in this way; leather is excellent, molded rubber is excellent.

The wrist strap should be amply long for easy accommodation of the gloved hand, wide enough to prevent cutting of the wrist and twisting, and nicely flexible. Some poles have adjustable straps, which may prove handy but are not a compelling consideration.

Snow rings are available in a variety of materials: plastic, aluminum, rubber, rattan, Duralumin, etc. The Duralumin is probably best, combining lightness with great strength. Rattan is cheapest and shortest-lasting.

In examining poles before purchase, satisfy yourself that the attachment of ring to pole is stout and secure. All too often a cheap but gaudy pole, when thrust into the snow for support, keeps right on going down through the snow and into the ground, while the snow ring, broken free, rides up the shaft like a monkey on a stick.

The point of the pole should be good steel but need not be extremely sharp. Figure 4 shows the desirable details of three excellent makes of poles.

Among steel poles which test high in use and have excellent straps, grips and other design features, we recommend those made by Komperdell, Northland and Eckel, among others. The glass poles called Cris-

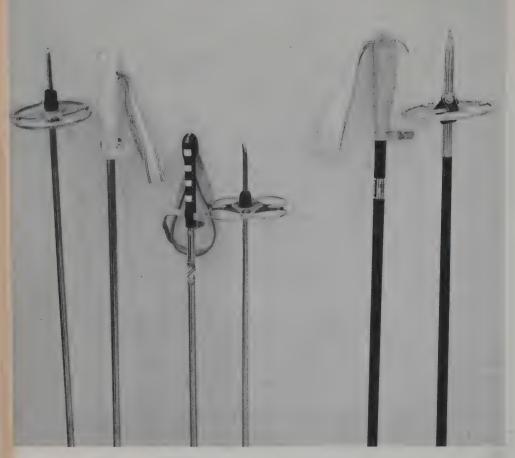


Figure 4 — SKI POLES. Left to right, steel pole by Eckel, steel pole by Komperdell, glass pole by Cortina. All three are sturdy yet light, have a supplementary small strap or tab for fastening the poles together when riding a lift or for carrying. Eckel and Komperdell have leather-covered grips and comfortable wrist straps. Cortina grip is molded rubber, wrist strap is adjustable in length. All are available in a full range of lengths.

tallo, made by Cortina, are also recommended. An adequate pair of poles may be had for as little as \$6; the best poles needn't cost more than \$15.

SKI CLOTHING

Ski garb is available in a great variety of materials, designs, colors and styles. Individual taste must be your guide in its selection. In general, the gaudier gear is worn by the least expert skiers, perhaps because they wish unconsciously to compensate for their lack of skill,

perhaps because they buy by appearance first, rather than reserve the matter of looks until after the principal considerations of function, fit and construction have been attended to. This is unfortunate. It's unlikely that a novice can go terribly far wrong in equipment, since even the shoddiest is made by firms having some experience in the field; with clothing, however, it can happen that any clothier who thinks there's a good market for ski wear (and there is) may turn out skiing wearables that aren't usables. We don't claim at all that you'll be sure of getting the best by spending a lot — especially if you're influenced by fancy trimmings — but well-made ski clothing of good material can't cost as little as that which is poorly made or of inferior material.

Obviously, the same applies to all clothing; but purchasing ski clothing entails two hazards all its own: the clothes must perform a very specialized function as well as look well, and they require expertness in design and construction (in addition to mere fit).

Pants. Trimness and slimness are what you want — a snug and wrinkle-free fit. Don't buy it at the expense of freedom of movement, however. Try on ski pants over the underwear you're likely to wear on the slope; do a few knee bends and high kicks. The straps or webbing that pass under the foot should not pull too tightly. Your knees should feel complete freedom of motion. "Stretch pants" should be tried, by all means; their elasticity permits superbly snug fit with a wonderful feeling of freedom — in fact, one who wears them is hardly conscious of them at all.

If you are tall, be especially sure that bending at the knees and bending forward do not pull the pants legs up so that they will clear the top of your boots. If you plan to wear a short ski jacket, make sure the ski pants come up high enough around your waist so that when you bend forward the jacket still covers the back of the waistband. Women especially — since women's trousers are often made long in the seat but short in the legs — should make certain that ski pants are long enough (come high enough) in the crotch. Over-all length will not compensate for this inadequacy. On the other hand, it's safe to get a quite tight waist; the average person of sedentary habits usually loses one or two inches of waistline in even one week of daily skiing!

One of the most common mistakes made by novices in buying ski pants (and ski jackets, too) is to purchase them for warmth. Warmth is supplied by undergarments; ski pants and jackets should be light in weight, closely woven, smooth, and snow repellent.

In purchasing ski pants and jackets, make sure there are plenty of pockets, and that the pockets are provided with zipper or good button closure. Zippers should have a large enough tab to be drawn open or closed without requiring removal of gloves.

Underwear. The comfortable skier is he who has next to his buff a full-length suit of armor against the cold. Get it large enough to allow easy movement without binding at arms, shoulders, or crotch, but not so large that it will bunch up. Fifty-per-cent wool or all-wool, when available, are about equally good. All-wool has a slight edge in this respect but is harder to care for and launder without shrinking. Red flannel is thought quite gay by some, but unless awareness of it gives you an inner glow, the color won't affect your body temperature. Most skiers find one-piece long underwear the most satisfactory, although if there is any likelihood of stripping to the waist — when climbing, for instance, or in spring skiing — two piece underwear would, of course, be preferable.

Socks. You will need two pairs of socks inside your ski boots, a lightweight under pair and a heavier outer pair. A half-size difference between these pairs is advisable. The inner pair should be soft, pure washed wool, but one should avoid the kind of lovely-looking fuzzy wool which rolls up into balls under your feet. The outer pair should be of unwashed wool, the kind of wool that has the natural oils left in, which makes it moisture repellent. When you buy your socks, buy sock stretchers to dry them on after washing. Tight socks and good skiing don't go together.

GLOVES. Cold hands are the bane of the winter sportsman, but they need not be if the advice of the experts is taken. Ordinary lined gloves are not always satisfactory. The leather wets through all too often, for one thing. For another, fleece- or fur-lined gloves soon get worn, matted down, and thin at the finger tips, which are most vulnerable to cold. And most gloves are either too short in the cuff to make a closure with the jacket sleeve or, if they are the gauntlet type, too open and loose to keep out snow. Your best bet is to consider only those gloves and gauntlets which are designed for skiing. These will provide warmth, good closure, ample length at wrist, water repellent leather all around or on palms only (with wool back), and a removable or integral lining warm enough and durable enough to give you warmth ali day long.

Mittens are not especially recommended. Years ago they were preferred, especially those which came in outer and inner separate mitts, called choppers and liners. There's nothing wrong with good ski mittens and it's true that having all fingers of the hand in contact, and in the same air space as the hand itself, makes keeping the entire hand warm a much surer bet. But this virtue is pretty much offset by the inconvenience of manipulating gear and equipment with the mittens on — and taking them off may mean that they and the bare hand will become too chilled to warm up again in a hurry.

SWEATERS. Two lightweight, good-quality sweaters are warmer than one heavy one. Slipovers are preferable to cardigans; round or turtleneck sweaters will give more protection to throat and respiratory tract than V-neck.

The skier has a double problem in outer clothing: He must be warm enough on his way to the skiing area and riding the lift, yet not too heavily clothed while skiing, since, if he is, the exertion will make him perspire, a sure way to get chilled. So do not dress in such a way that it will be inconvenient to peel off a sweater or two.

SKI JACKET. Ski jackets are often things of beauty; much less frequently are they joys forever. Whether you get the blouse type that tucks into your ski pants and has a drawstring at the waist, the shortcoat type, also with drawstring, or the shorter monkey jacket with elastic waistband, be sure of the following things: raglan-type sleeves, shoulders wide enough to accommodate sweaters underneath and still give free arm movement, full enough cut so that raising the arms doesn't jerk up the waist, zipper closure with a large enough tab on the zipper to be grasped by a gloved hand, sufficiently long sleeves to protect wrists, long enough skirt (or tight enough waistband) to prevent entry of snow under the jacket in a sliding fall.

As with ski pants, windproof, water-repellent, lightweight cloth is best. Ski jackets of Byrd cloth, Zelan, and similar materials are excellent. Quilted jackets are fine for riding in an open car — on the slopes they may prove cumbersome. Light colors often look well but they show stains and smudges of ski wax very easily and may not prove as warm as dark colors in sunny, cold weather, since dark colors absorb radiant heat while light colors reflect it. Some fashion "experts" to the contrary, you'll feel happier on the slopes if you shun loud colors.

Accessories. Ski caps or headbands of knitted wool protect the

head and ears. If it is cold enough for you to pull the ear flaps in your cap down over your ears for protection, a glimpse in a mirror may convince you that the neat, knitted headband looks better. There are many styles, shapes, and colors of ski caps, all adequate and each with its special advantages. Only one word of caution in buying is needed: Loose fit or long visor may be the cause of your trudging up a slope to recapture a fleeing cap that has blown off in a gust of wind.

Flannel shirts are available in a variety of colors and styles. Their purchase is a matter of taste, but attention should be paid to the shirt-tails, which must be long enough to stay down inside the trousers despite active body movements. Ounce for ounce, flannel shirts are not as warm as sweaters. The thick, lumber-jacket type shirt is unsuitable, since it will be bulky under a ski jacket and cannot substitute for one, being porous and fuzzy.

If you ski in the spring, or in areas of few trees and bright winter sunlight, goggles will be needed to protect your eyes from glare. Snow blindness caused by glare from snow or ice is extremely painful, though rarely encountered in the average skier's experience; but the actinic rays of the sun, reflected from snow, can do permanent injury to unprotected eyes before one becomes aware of discomfort. Never wear breakable glass goggles. Ski goggles, which are of unbreakable plastic and protect the corners of the eyes as well as the pupils, are inexpensive.

A small knapsack or rucksack to carry sandwiches, thermos, extra socks, extra sweater, ski waxes, etc., is extremely useful. Don't load yourself down with a large one, and whenever possible park your knapsack near the slope in a safe place. It's much easier to ski unencumbered. Incidentally, fancy dinguses containing a variety of waxes and scrapers, and made to hang on the belt, may look snappy in the store, but they can be mighty painful to fall on.

GADGETS. There's an unending variety of gadgets for the skier, some of them useful and ingenious, others merely decorative or intriguing. The aesthetic response you feel when you see ski equipment can lead you to load yourself up with all manner of doohickeys which are harmless enough but won't do much more for you than provide you with playthings. On the other hand, there are definitely helpful gadgets, not absolutely essential but very useful — and very appealing, too. You'll find some few of them pictured in Figure 5.



Figure 5 — GADGETS. Following the lettering: (A) Head steel-edge sharpener: (B) two sizes of Jon-e-Warmers, handy doohickeys which work (with complete safety) like enclosed cigarette lighters, may be carried ignited in pocket or against the body; (C) ski waxes by Northland; (D) Tyrol boot press, adjustable to fit any size of boot, keep it from curling - boots are held sole-to-sole and the press makes an easy, handled carrier for them; (E) Moody Ski Driver is equipped with leather case, has Phillips screwdriver which is right size for the little screws holding steel edges to skis -- its handle contains spare screws and pegs, for on-the-slope repairs to loose or ripped-out edges; (F) Gossner flexible shackle lock reels out a stainless-steel cable which can be passed through ski bindings, pole rings and around car racks to prevent theft; (G) Swiss skier's knife has usual blades plus scraper, file, Phillips screwdriver, tweezers, steel loop for a carrying lanyard; (H) Anderson & Thompson tow-rope gripper spares hands and arms, pulls you from waist; (1) Ski Höndel lets you tote a pair of skis clipped together at their balance point; (J) Bouton "Softsides" goggle gives wrap-around vision; (K) handy rubber clips hold heel and toe of skis together for stowing or carrying; (L) Meiss goggles come in leather case, have interchangeable acetate eyepieces of various colors; (M) Bouton goggles have ventilated foam-cushion sides, interchangeable eyepieces; (N) Porath and Mangeheim goggles are a boon to those who wear glasses because rubber sides are shaped to accommodate frames.

LACQUERS AND WAXES

The function of waxes has changed over the years. In the pre-plastic days of hickory, one function of wax was to protect the wooden running surfaces of the skis. Now this part of the job is done by plastic lacquers and sprayed coatings. Virtually all skis come with their bottoms already coated — a lucky thing for the average recreational skier, since there are dozens of these finishes with varying virtues and varying claims. It's nice to know the ski manufacturers have gone a long way toward solving the matter of choice — by eliminating it. Chances are very good indeed that the ski you buy will have had its lacquer coat predetermined by its maker in terms of the use for which the ski was designed and its special physical characteristics. Thus, you'll be automatically spared the error, for example, of putting a too brittle, hard lacquer on a very limber ski — which could only result in the cracking and peeling of the lacquer.

Bottom finishes do get gouged and scraped, of course, but they are pretty tough and the waxes you put over them to aid your skiing also offer them some protection. Should you gouge a ski down to bare wood by skiing over a rock, or nick the lacquer badly, you can reapply a lacquer covering for that part of the ski without refinishing the bottoms entire. Use the same lacquer as the original coat for this, and make sure the area to be patched is bone dry and clean and that the surrounding lacquer is sanded or steel-wooled to provide a "tooth" to which the new coating will adhere. Follow makers' directions for pouring on lacquer, painting it on, or spraying it from a "bomb."

Of the many lacquers on the market, six seem outstanding, though others may do just about as good a job. Certainly, for the recreational skier, the differences will have virtually no effect on his skiing; the wax he applies and the way he applies it have far more to do with that. Following are the six with — after them and in parentheses — some of the better-known skis on which they are standard: Celloblitz (Blizzard), Celloglis (Dynamic), Celloking (Kneissl), Kofix (Kästle and Blizzard), Permacite (Northland), Araldite (Attenhofer Metallic). Kofix may lead the rest in its wax-holding qualities; Permacite is among the toughest, though it is not as fast as some others.

The purpose of ski wax is to keep the skis and snow from sticking to each other and to help the skier glide freely. There are over a hundred waxes on the market. There are thousands of self-styled experts on the

art of ski waxing. There are almost as many theories of waxing as there are skiers. You can buy special snow thermometers, charts, waxing guides, spreaders, rubbers, scrapers and other gimmicks for "scientific" waxing. All this is fine if you are entering a downhill, slalom, or cross-country race, where split seconds count. By the time you're ready for that, though, you will have your own waxing technique which you will swear by, defend and, if necessary, fight for.

The beginner need not worry about the fine points of waxing. For his purpose, a ready rule of thumb is all that is needed. Here it is: The drier (colder) the snow, the harder the wax; the wetter (warmer) the snow, the softer the wax. Dry snow, hard wax; medium snow, medium wax; soft snow, soft wax. Easy? There is just one more rule to learn: Hard waxes are smoothed on and rubbed in well and evenly; soft waxes are not polished down quite so smoothly.

Here is a simple way to test the snow so that you will be able to apply the first rule: Cold, dry snow will not pack into a throwable snowball. Medium snow will pack into a snowball, but the snowball can be broken by squeezing between thumb and forefinger. Wet snow will pack into a hard, wet, gray ball.

The beginner, or even the intermediate skier, needs only four waxes. Select a reliable, easily obtained brand and stick to it. Learn its characteristics and how best to use it. Later you can experiment with other types.

You will need a fairly hard wax, a medium wax, and a soft wax. A stick of ordinary paraffin is your fourth wax.

Waxes are applied over the base lacquer already described. The wax stick is rubbed lightly over the running surface of the skis, from tip to heel, several times. Bits of wax adhere to the running surfaces and are then rubbed smooth and evenly distributed with the heel of the hand and the palm, or with a waxing cork. Do not wax the groove of the ski. Do not wax too thickly, especially when applying the harder wax. (In very wet snow, rough-waxing with paraffin will prevent adhesion of skis and snow particles.) Do not apply new wax over old if it can be avoided. Scrape off the old wax down to the lacquer and start fresh.

A common error into which many beginners fall is to wax roughly and without polishing. The theory they work on is that this makes the skis climb easily, without slipping back, and that it makes them go more slowly downhill. Both are true. But to move slowly downhill under such circumstances is not to move safely and without falling.

Skis rough-waxed for climbing will catch and jerk unevenly on their slow, downhill way, and the beginner will fall each time this happens.

Another typical beginner's waxing error is to wax his skis indoors, where it is warm, and then to take them out for use immediately. A warm ski when placed on snow will melt just enough of it so that as the ski cools, a thin layer of ice forms on it. Iced skis adhere to snow and will not slide. If you wax in a warm room, stand your skis outdoors and in the shade until they have cooled to outside temperature.

Paraffin is excellent for moist or wet snow. If your skis stick to the snow and you cannot solve your wax problem easily, apply a layer of paraffin. It has one serious drawback, however: It wears off very quickly.

Special climbing and special downhill waxes need not concern the average skier.

CARE OF EQUIPMENT

BOOTS

Keep strong shoe trees in your boots when they are not in use. Do not dry them without trees to hold their shape, and do not dry too rapidly or in front of a fire or hot stove. Do not oil or "soap" them; this makes the leather flabby and stretches it, and the excess oil which penetrates the pores of the leather hardens when exposed to cold so that the pores stay open. One or two applications each season of a dressing recommended by the manufacturer are sufficient. Ordinary shoe polish, used daily, keeps boots looking well and in good condition.

POLES

Leather parts of ski poles should be kept well softened and pliable by periodic application of leather dressing or saddle soap. Two or three times a season will suffice. The wrist strap, especially, must be kept untwisted and soft.

SKIS AND BINDINGS

When not in use, skis should be clamped together at heel and point of tip-contact and a spreader block placed between them at their widest separation to preserve camber. Do not use a block or spreader which forces them apart beyond their normal separation. If the clamp used is the kind which has attachments for holding the tips of the skis, adjust the attachment to fit the upcurve as it is — don't force the tips into a sharper curve. After use, skis and bindings should be wiped dry. Never put a wet or moist ski near heat. The hinged parts of ski bindings should be lightly oiled with a thin gun oil which will not turn gummy or stiff.

When not in use, skis properly clamped and blocked should be stored in a cool, dry place. Don't depend on rubber snap-on holders to keep the skis held together when not in use. These rubber gadgets are all right for carrying skis to and from the slope, but that is all they are meant for.

NOMENCLATURE

Every movement and maneuver described in this book is illustrated by a photograph or a diagram or both. Everything is labeled. Much confusion results from the usual custom of sometimes calling a spade a spade, and sometimes referring to it as a club, heart, diamond, or shovel. For example, when the terms "inside ski" and "outside ski" are used exclusively to identify the skis in the execution of a turn (the inside ski being the one nearest the center of the turn, as shown in Figure 6) everything is fine until the next step is reached and the turn becomes an S curve, when all at once the outside ski becomes the inside ski, and vice versa.

The same limitations beset those who stick to the terms "uphill ski" and "downhill ski" since a change of direction changes the names, and downhill ski becomes uphill ski.

In this book such confusions are avoided by the following means. Turns (which are the principal maneuvers in skiing) will be identified in most cases as "right turns" and "left turns." The term "right ski" will apply to the ski worn on the right foot, "left ski" to that worn on the left foot, and skis in the diagrams are marked accordingly, L and R (Figure 6).

When such a distinction is unnecessary, or tends to make the description too complicated, the terms "inside ski" and "outside ski" will be used (as in the simple turn shown in Figure 6) as well as the terms "uphill ski" and "downhill ski."

All diagrams of maneuvers show a top-down view of the skis and a cross-section of them. A black ski indicates that the entire weight of the skier is supported on that ski. Identically shaded skis indicate that the weight is equally distributed on them. A white ski is completely unweighted (though not lifted clear of the snow). Whenever it has proved feasible, the actual track of the skis through the snow has also been indicated in diagrams. And in turns where shoulder action is used, the position of the shoulders is shown, and arrows indicate their motion. In most cases, an actual top-down drawing of the skier is shown.

This is all you will need to know in order to study the following chapters. New words will be explained as they are introduced. Always study the diagrams, drawings, and photographs closely, observing position of skis, feet, ankles, knees, legs, body, shoulders, arms. Numbers accompanying the various elements of a diagram refer to the same numbers in the text or in the photographs.

Note: In the diagrams YOU, the skier, are considered to be at the top of the hill, looking down. Therefore, as you hold the book for reading, the BOTTOM of the page is UPHILL, the TOP of the page is DOWNHILL and the RIGHT of the slope is to YOUR RIGHT.

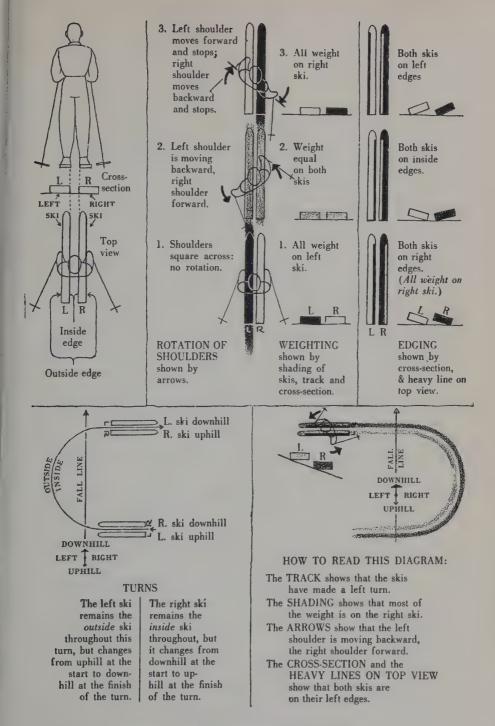


Figure 6 - NOMENCLATURE - DIAGRAMMATIC NOTATION.

DO'S AND DON'TS

Do keep your equipment in proper shape. If it's worth having, it's worth caring for. You'll have better skiing if you take a little more trouble in treating your gear well.

Do familiarize yourself with the simple diagrammatic notation and the nomenclature used in this book. It will aid immeasurably in the learning process.

Do take your time in buying equipment. It is better to miss one weekend of skiing than to suffer because of bad equipment for the rest of the season.

Do purchase and use the four basic waxes and get to know them.

Do make sure your skis are neither too stiff nor too springy.

Do be guided in your purchases by quality and functionalism — looks are secondary.

Do work right through this book, and make sure you understand not only the how of things, but also the why.

Don't economize in the wrong places. Poor boots and bindings can keep you from becoming a skier; lack of stylish trimmings can't.

Don't become a victim of waxing fever, the symptoms of which are buying lots of waxes and spending skiing time trying to figure out the use of them.

Don't gloss over what may seem like simple exercises; everything in this book is there for a reason.

Don't ski when you are feeling ill or when the weather is bad and snow conditions dangerous. Better to lose a weekend than earn the right to a hospital bed.

Don't experiment with a variety of "schools" and "systems"; select one and stick to it.

Don't overdress for skiing. It's better to shiver a little, until you warm up by skiing, than to perspire on the slope and then get chilled.

Don't rush the learning process. You can't expect to make stem christies your first day, and you'll never make a good fast turn until you can make a successful slow turn.

First Steps on Skis

Well, well. Here you are, all dressed for skiing, all equipped with nice new gear, standing on the snow at the foot of a perpendicular hill a million miles high, in constant danger of being run down by madmen skimming all about you, having trouble enough standing up in your boots, let alone on a pair of slippery boards. You think of a nice hot, stuffy movie theater, or the comfortable seat you might be occupying in front of the fireplace. "Why," you ask yourself with some asperity, "why didn't I go to Florida this winter?"

Before the end of the season you'll be standing at the top of that same hill (which has miraculously shrunk to a nice, easy slope) looking down on another tyro who is experiencing the same sensations of rubbery knee and hollow stomach that you can dimly recall having felt. Do you gloat? Not you; you're a skier now, and skiers are gentlemen about such things.

But it's not the end of the season yet, it's the beginning. At least it's the beginning for you — it is your first time out. Well, you think, let's get our skis on.

At this point a friend or a well-meaning stranger comes over to "help" you and teach you. Shun him as the plague! Send him away with polite thanks and, if that fails, growl at him, make faces or utter fierce and incoherent sounds. He is the bane of the nursery slope. He's not a qualified teacher, nor is he likely to be a very good skier; if he were, he'd be somewhere else, with the other experts. His offer of help is probably one tenth altruism and nine tenths a desire to show off.

What you need on your first day is peace and quiet to get the feel of

skis on your feet, and to experiment. So you walk to a nice, private spot, a nice, level, open space, and you put down your skis. They are usually marked L and R just in front of the binding.

Place the skis flat on the ground and parallel. Plant your poles firmly in the snow on either side of the skis. Stand between the skis and insert the toe of the left boot into the toe iron of the left ski. If the ski slides forward, you can hold it firm by hooking the snow ring of the left pole over the ski tip (Figure 7). With the toe inserted in the toe iron, complete the closing of the binding.

Now follow the procedure outlined above, and put on the right ski. This will be a little harder, since one foot is already on a ski, but you will soon learn the knack.

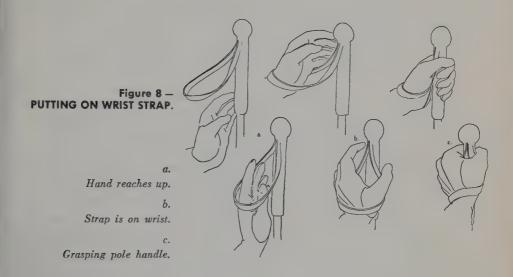
Correct holding of the poles comes next. Place the hand with palm touching the shaft of the pole well below the hand grip and wrist strap (Figure 8a). Move the hand up through the wrist strap until the strap is well onto the wrist (Figure 8b). Then grasp the hand grip (Figure 8c). Held thus, correctly, the poles are used with the combined strength

Figure 7 - PUTTING ON SKIS.



of hand and wrist, yet the strap does not cut off circulation. If the pole is accidentally dropped from the hand, it trails from the wrist strap and can be grasped again.

And now you're ready to shove off.



SKIING ON THE LEVEL

Skiing on the level is merely a gliding walk. Suppose you want to start with your left ski. Weight is on right ski, you slide the left ski forward, glide on it as much as possible, then, before the glide stops, smoothly shift the weight forward onto the left ski and, as the glide diminishes, slide the right ski forward. The two main differences between the ski-walking step and walking without skis are these: On skis, you don't lift your foot, but slide it forward; and on skis you help your walk with the ski poles.

When you stride along the street you use your arms in what is known as "opposition"; that is, when your left foot goes forward, your right arm swings forward, and vice versa. The same is true in the walking step in skiing; as you advance your left ski, your right pole moves forward, and vice versa. The poles are planted in the snow and are given the propelling thrust with shoulder, elbow and wrist, the shoulder doing

most of the work. Keep your arms close to your body so that you get maximum leverage on the poles.

Walking on skis should be done in a relaxed and easy way. Tension, especially in the knees, will result in strain and bad balance. The price of tension is a dunking in the snow, which isn't bad but doesn't come under the head of progress.

So walk relaxed. Try to get body motion — a little "oomph" — into your glide, a little rocking from ski to ski as you shift weight, a yielding of the knees as the weight comes onto first one ski, then the other, a rhythmic rolling of the shoulders as you thrust with first one pole and then the opposite pole.

Most of all, keep your weight nicely forward, from the ankles up. Don't lean your upper body forward while your seat sticks out behind; if you do, your knees will be stiff and you'll look like a courtier making a sweeping bow. This position is swell for bowing. It's also unsurpassed for tipping you over on your side if one ski goes over a slight bump (because you'll have no knee action with which to adjust to it) and it sets you up for a sit-down. Want to prove it? O.K.

Stand up. Yes, right now. Lock your knees straight, toes and heels together. Bend forward from the waist, as in a bow. Now try to bend at the knees without shifting your weight forward. See what happens? You can't do it without falling unless there's a chair behind you to catch you. But on skis you never get a chance to find this out, for the moment you make the initial movements in this sit-down stance, your skis will slide forward, leaving you behind. Get up, smile sweetly, and fill in the bathtub you've just carved in the snow. Or don't make this typical mistake in the first place.

Look at Figure 9. Note how the skier in the top two photographs is walking — weight forward, knees flexible and easy, head up and looking forward, not down at the skis. Note the poles, close to the body so that maximum thrust is delivered.

Now look at the poor chap in the bottom photograph. He's using arms and legs in unison instead of in opposition. His skis are too far apart; they are not parallel; his knees are stiff; his tail is wagging out behind him; and his poles, which he has mistakenly flung out to the side for balance, are useless because he can't get any leverage on them that way. We won't show you the last picture, in which he is comfortable. Later, he will get up and try again.

Figure 9 -WALKING ON LEVEL

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- 2182 1 1/1 1/16 1/16 1. 18





2

Figure 9A -WRONG WALKING ON LEVEL.

Poles incorrectly held right ski and right arm use stroves for ward together "not in opposition), skin neminer chine nor parallel, राजका शांध



DON'T

Figure 10 — FALLING AND GETTING UP.

- 1. Down.
- 2. Rolling over.
- 3. Drawing parallel skis up to body.



FALLING AND GETTING UP

Let's face the fact that you are going to fall. It's no sin, and it won't hurt you, because you are fairly well padded with clothing, and snow is soft and yielding.

If you feel yourself falling, make a normal effort to retain equilibrium, but don't fight the fall to the bitter end. You'll wind up in a tangle of skis, poles and cuss words if you do. Instead, let yourself fall relaxed, keeping your poles out of your way, and falling to the side, when possible. And when you're down, stay down for a moment — don't struggle.

So you're down — you've fallen. How to get up? First roll over on your back with feet in the air. Then get your skis parallel and pointing in the same direction. Get them close together. Roll onto your side, and draw your skis up as close to your body as possible, knees bent to the maximum. You are going to push yourself upright with the help of your poles, so when drawing up your legs against your body, do it in such a way that your feet are drawn up under your seat, not in front of it or behind it. If your feet are forward of your seat, your skis will slide out from under you as you get your weight on them; if your feet are too far back, the skis will slip out behind you.

Once your skis are properly drawn up, take the wrist straps of the

- 4. Planting poles.
- 5. Pushing up.
- 6. Up.





poles off your wrists, and grasp both poles together, just below the hand grips, in your free hand (that is, the hand on the side you are not lying on). Grasp both poles in the other hand just above the snow ring. Now plant both poles together, gripped as described, in the snow, about on a line with your head, and fairly close to it. Planted firmly and held in this way, you can use them to push yourself up. You may want to change the placing of the hands and the planting of the poles, depending on the length of your arms and the length of your poles. Remember, though, the object is to be able to use the poles to push yourself up. Do not try to pull yourself up. You have more strength and will have better balance in pushing than in pulling up (see Figures 10 and 10A).

If you fall on a slope, roll onto your back, turn around so that your head is uphill of your body, swing your skis downhill, get them at right angles to the slope, then pull them up close to the body and proceed as above. If they aren't at right angles to the slope, the skis will run





DON'T

Figure 10A — WRONG WAY UP. All the skier's straining will come to naught; as soon as he's up a little higher, his skis will shoot forward and he'll be down again.

away while you're trying to get up, thus producing an effect more suitable to adagio dancing than to skiing. One faceful of snow can cure you of failing to place your skis across the slope, but why learn the hard way?

STEP TURN

Let us assume you have managed to walk along with some success, and you come to the end of your clear, level space. You want to turn. You will discover very soon that the degree of turning you can do with one ski is limited by the fact that the skis will cross if you turn one at all far. Crossed skis make the shape of a letter X, which marks the spot where you either fall or uncross them and find yourself still headed in the same direction and no turn accomplished.

Here is how to do it. For a right turn, lift the right ski off the snow, very slightly, mostly at the tip (the ski pivots from the tail end) and turn your foot outward a little. Plant that ski on the ground, put your weight on it, and lift and pivot the left ski so that it comes parallel and close to the right. Repeat until you have turned the desired amount (Figure 11).

Now try to combine the forward walking step with the step turn. With a little practice, you'll be able to execute a reasonably smooth circle, sliding forward on the turned ski, sliding a little forward again as you bring the other ski parallel to it.

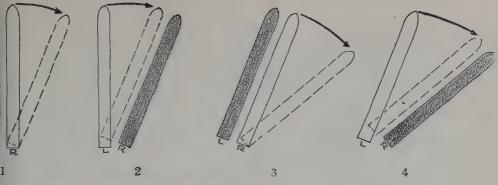


Figure 11 - STEP TURN. (Four phases)

And now for a word of special advice. Don't ever, until you're an expert skier, make two turns in succession which are in the same direction. If you start with a right turn, make a left turn before you make another right. And vice versa. There are thousands of temporarily stopped skiers today whose "block" is that they can execute a maneuver in only one direction, or better in one direction than in the other. It is a hard block to break; it is easy to avoid suffering from it if you practice every step and turn in both directions, initiating the movements with first one ski and then the other. If you develop unevenly, so that a right turn, for example, is easier for you than a left turn, then withstand the temptation to demonstrate your skill, and practice the left turn until you can do it as easily as the right turn. Then alternate again.

KICK TURN

The kick turn is the best and quickest way to reverse direction and is part of the repertory of every good skier. It looks tricky but is easily learned if you learn it right. Once you know it, you'll wonder how you ever found it difficult.

To kick-turn to the right, first plant your poles firmly in the snow with the left pole at the left ski tip and the right pole at the right ski heel (Figure 12-1). Now you must kick your right foot forward and up — swing it as though you were trying to kick a football. You must kick it high enough so that the heel of the ski just clears the surface of the snow when the ski points straight up (Figure 12-2) and far out enough so that the heel of the right ski lines up with the tip of the left ski. The height of the ski from heel to binding, plus the weight of the ski and the boot, may make this seem like a tough job. It isn't, though, if you use this simple trick: Swing the kicking foot back a bit first, just



Figure 12 — KICK TURN.

- Planting poles.
 Kick.
 Halfway tip to heel.
 Bringing second ski and pole around.
- 5. Finished turn.



2



as you swing a golf club or tennis racket back before your stroke, and then swing your foot out and up; don't try to lift it by main force.

When the right ski is up, don't stop at the top of the swing, but turn the ski as though you were pivoting it on its heel, and let it come down to the snow in its new direction, so that the skis will be close together and parallel, but tip to heel (Figure 12-3). Now lift the entire length of the left ski clear of the snow a few inches and swing it around (Figure 12-4) until it can be placed on the snow alongside the right ski and parallel to it. The left pole comes around with the left ski. You are facing in the new direction (Figure 12-5). Practice kick turns to right and left. Get plenty of swing into the kick. Learn to make the turn in one fluid series of motions, not as separate, jerky ones.



41



2





Figure 13 — UPHILL TRAVERSE. 1. Uphill ski is forward; downhill ski and pole start to come forward. 2. Downhill ski is forward and planted; uphill ski will now move ahead.

TRAVERSING UPHILL

"So far so good," you say, "but what about actual skiing, down-hill?" Well, we'll assume you've walked and step-turned and kick-turned enough to be somewhat acquainted with your skis, and that you are looking tentatively yet with increasing frequency at a nice gentle

Figure 14 — UPHILL TRAVERSE.

- 1. Left ski has been planted; right ski starts forward.
- 2. Midstride.

1

1

3. Right ski ahead, left ski ready to advance.





slope and thinking you'd like to try it. But you have to get up first. The simplest way up is called traversing (Figure 13). This merely means that instead of attacking the hill head on (in which case your skis would slide backwards), you angle up the hill by going at a diagonal to the slope. If, in doing so, your skis tend to slip sideways down the slope, tilt your skis slightly so that the uphill edges bite into the snow. If you are going up a hill in a traverse from the lower left of the hill to the upper right of it, for instance, the hill is to your left, and you would edge both skis on their left-hand (uphill) edges. You can do this properly only if your knees are nicely flexed, your weight centered on your skis (leaning neither forward nor back), and your knees pressed in very slightly toward the slope. Your body must be at right angles to the skis, and leaning neither toward the slope nor away from it (Figure 14).

Let's suppose you've traversed a third of your way up the hill in this way, and you come to an obstruction. Bring the skis squarely across the slope, then do a kick turn, always turning uphill, with the uphill ski doing the kick, and traverse again in the opposite direction.

Figure 14A — WRONG UPHILL TRA-VERSE. Note flat skis, not edged to maintain secure climbing; body leaning forward from hips; skier trying to push uphill with poles.





3

HALF SIDE STEP

If you have difficulty traversing your hill without backsliding, you can make a less oblique traverse. Or if you want to get up more rapidly, you can use the half side step (Figure 15). Imagine yourself at the foot of a flight of stairs. You stand sideways, with your feet parallel to the edge of the stairs. The half side step is a combination of this sideways stair climbing and the regular skiing walk. Get thrust with your downhill pole, keep the skis edged into the slope so that they don't slide sideways, and remember to step forward as well as up with each step. The uphill ski reaches forward and up while the downhill ski holds your weight. Then the uphill ski takes the weight (edged uphill and firmly planted) while the downhill ski is brought up alongside it and ahead of it, as in walking on the level. Arms and body are used in a rhythmical way, as they were in walking, and shoulders are kept squarely forward and at equal height.



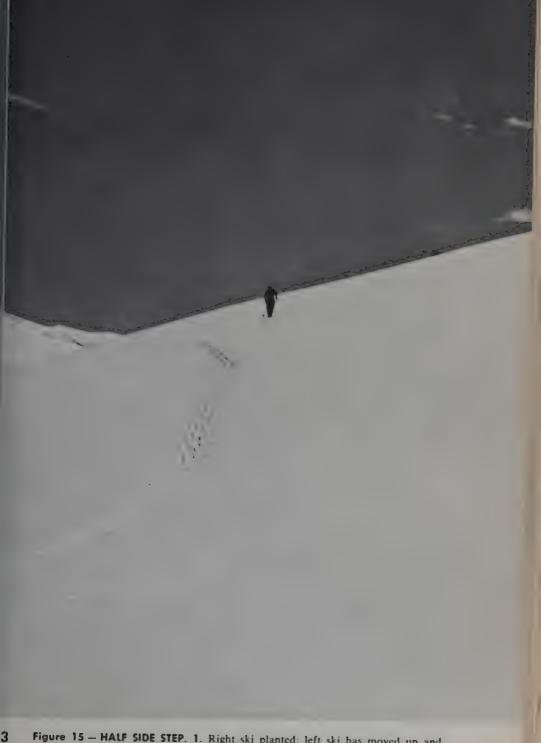


Figure 15 — HALF SIDE STEP. 1. Right ski planted; left ski has moved up and forward. 2. Left ski planted, right ski moving up and forward. 3. Track shows uphill traverse leading into half side step.

SIDE STEP

The quickest way up (and the most tiring — but it's the only way on very steep slopes) is the side step. This is our friend the sideways stair climb, done without any forward progress whatever, just right up the slope (Figure 16).

There is one other way to climb a slope. This is the herringbone step, but we'll come to that later. Right now, you want to ski down this hill we've just climbed.

SCHUSS

The act of skiing straight down a hill, without turning or checking speed, is called downhill running, or, at high speeds, the schuss. (Let us flatter ourselves, and simplify matters, by calling all straight downhill running schussing.) Your first schuss will feel like flying. So will your second — and your thousandth. That's one of the wonderful things about skiing.

The ideal setup for your first schuss is a short hill, with a gentle, even slope and a long, level runout at the bottom. If you can find it, well and good. Climb to the top, using traverses linked by kick turns, the half side step or the side step. Once on the level at the top, do another kick turn, walk to the start of the slope, and you're ready.

Most likely, though, you won't find a ready-made small hill. Select a hill whose lower slope is gentle, and where there is a good runout. Go up it fifty feet or so (that's enough for your first schuss) and get your skis at right angles, across the slope. Make sure you have a firm



Figure 16 — FULL SIDE STEP. 1. Right ski planted; left ski and pole moving uphill. 2. Left ski planted; right ski and pole moving uphill.



stance, so that you can take your poles out of the snow without sliding in either direction. Plant your poles downhill, lean on them, and stepturn around until your skis are pointing straight down. Your poles will keep you from sliding forward (Figure 17).

Whether you start from the top of a small hill, or from part way up a slope, once you are turned around and your skis are pointing downhill straight the procedure is the same.

Here is the correct schuss position: skis one to two inches apart, one ski a few inches in advance of the other, weight equal on both skis, knees directly above skis — that is, neither knocked inward nor bowed out. Skis flat, not edged. Poles are held with arms close to body, but not pressing it; points are down near the snow but not dragging; the poles make a V out behind you; your elbows are a little out from the body, just enough so that the poles make their V without your having to bend your wrists. Hands are held just a little above the knees; elbows, though bent, are relaxed, not tense or "locked." (You can tell if your poles are correctly held by noting if the line from wrist to elbow is parallel to the line running from knee to hip.)

Flex your knees up and down a few times; as you flex them, keep your backside in and flat, not thrust out behind you, and your weight on the balls of your feet, but with the heels flat down on the skis. Try to bend forward from the ankles so that you can keep your body perpendicular to the slope; the steeper the slope, the more you lean forward, but don't crouch as if you were going to sit. Bend forward from the ankles, with the knees limber, and not from the waist.

Now — are you set? Let 'er rip. Don't look at the tips of your skis, but ahead of you. Head up. If your knees are stiff, the least unevenness of ground can tip you over. If you weight one ski more than the other, or advance the lead ski too far, your balance will be bad. If you give way to timidity and lean back, your skis will go out from under you. Take it nice and easy, ride the boards with flexible knees and courage, and you'll sail down the slope with ease.

Study Figure 18. It shows the correct schuss position. Note the lines drawn through body and skis. Toes, knees, and chin are in a straight line. The line is at right angles to the slope. This is known as vorlage, a much misunderstood word, as you can easily tell if you observe misinformed skiers who ski down gentle slopes leaning 'way out over their

ski tips or crouching as though they were going to ski through a barrel.*

Now look at the people in Figure 19. Poor Mr. A thinks he has fine vorlage just because his head is forward. But he has too much ballast out behind him. Friend B is plain scared and is sitting back. This weight to the rear of the skis is called rücklage, and it is an abomination in the eyes of the god of skiing. And C is suffering from the delusion that to get your weight on the balls of your feet you have to stand on your toes. D is demonstrating the average man's conception of vorlage.



Figure 18 — CORRECT SCHUSS POSI-TION. 1. Side. 2. Back. 3. Front.

Now look at Figure 18 again. Examine the position of heels, hands, head, back, hips, knees, ankles. If you can, put your skis on indoors, in front of a mirror, and assume the pose — but relaxed. Tenseness and skiing don't go together.

* As a matter of fact, most beginners who know something about the Arlberg theory (and, alas, some teachers) are so intent on avoiding rücklage, or backward leaning, that they overstress vorlage. Logic tells us that when the body is leaning too far forward, the slightest slowing of the skis, caused by changing terrain or a patch of slow snow, will promptly pitch the skier forward on his face. Similarly, if he is leaning back, he is in constant danger of having his skis shoot out from under him, leaving him behind. The ideal stance is one in which the axis of the body is at right angles to the slope, with the skier's weight squarely centered on the skis. In this position he is ideally poised to compensate for variations in speed or gradient by shifting his weight forward or back. High-speed skiers sometimes have to lean forward beyond the vertical line in order to overcome wind resistance, but the net resultant of the forces involved is still the placing of the skier's center of gravity over the center of the skis.



3



HERRINGBONE

Let's suppose you've mastered your first hill. You can schuss it with comfort and ease and are ready for new hills to conquer. You're ready to learn the herringbone, then, since you must climb before you schuss.

The herringbone is used to go straight up a hill and is useful on all hills that are not so steep as to require the side step. It's quicker and more direct than the traverses with kick turns, and it will keep you out of the way of skiers on their way down a slope, since you won't have to crisscross it.

This manner of climbing gets its name from the pattern it makes on the snow (Figure 20). The skis are in V position, heels close together, tips spread wide. Weight is on the inside edges of both skis. Poles are thrust into the snow behind the skis and are used "in opposition," as in walking; that is, the left pole supports and thrusts while the right ski is advanced, and vice versa. Plant each ski down firmly with each step, lift the heel of one ski over the other, and forge up the hill Charlie Chaplin fashion. The knees are bent well forward and are not sprung outward at all. If you maintain the proper knee position, strong edging will be easy.

Figure 20 - HERRINGBONE. Right ski going forward. (Note track.)



DO'S AND DON'TS

Do keep skis parallel in walking, or you'll do an involuntary split or X. Do use your poles with the wrist strap. Serious injury can result from a pole which slides through your hand and jabs you in the stomach or eye. In a fall, the pole used without wrist strap becomes a dangerous weapon.

Do refuse firmly all offers of "instruction" from well-meaning people. Only a qualified teacher knows how to teach.

Do practice all maneuvers in both directions.

Do be sure you are firmly "planted" before attempting a kick turn.

Do keep your shoulders square in traversing uphill and in doing the side steps. Dropping the downhill shoulder is a common bad habit, hard to unlearn and easy to avoid beforehand.

Do keep the skis tip to heel at the halfway point of the kick turn like this:



Don't walk on "eggs"; walking on skis, like all skiing, is free flowing, makes use of the entire body, is more a big-stepped stride than a tentative and mincing walk.

Don't edge out in the schuss. This is a common fault, caused by bowing out the knees.

Don't be a "one-way-turn" skier.

Don't ever put your poles into the snow in front of you in order to stop. Don't be a backslider. Be patient and make reasonable uphill traverses.

If you want to go up steeply, use the herringbone or side step.

Don't look at your ski tips; look ahead, to see what's coming.

Don't try to make a kick turn with a bent leg, like this:



CHAPTER III

Learning to Stop and Turn

SNOWPLOW

So far, your schussing has been done on hills where there is a sufficiently long and level runout so that you naturally come to a stop. Your speed in the schuss has been a matter of the steepness of the hill, the quality of the snow, and the waxing job you've done. Actually, you haven't been skiing; you've been taking a ride on skis.

The snowplow is a means of slowing down or stopping. As such, it is extremely useful. But it is much more than just that. The snowplow is the base on which all good skiing rests. It is to skiing what the egg is to the chicken — the beginning of everything. Many is the amateur and near-beginner who considers the snowplow drudgery, to be quickly learned and then never again used unless necessary. But mountain troops and some of the finest racers in the world make the snowplow a regular part of their daily training routine. You have to know the snowplow to do the snowplow turn, and you have to know the snowplow turn before you can think of graduating from the beginners' ranks.

Remember the herringbone, for going up the hill? The snowplow is, in a sense, its exact reverse. In the snowplow the skis are in V position with the toes together and the heels apart. The word "snowplow" is descriptive of the action of the skis in this V position: they offer resistance to the snow and slow your forward motion or stop it.

Before explaining how the snowplow is done, let us consider the prosaic subject of a pound of butter and a knife. Slicing a cut across

the surface of the butter with the knife blade is easy (Figure 21a). That's like your ski going downhill straight. Moving the flat of the knife over the butter creates a little more friction and takes more force in wielding the knife. If the force isn't increased, the knife will move more slowly in this position (Figure 21b). That's like the broadside of your ski presented to the slope, as in the snowplow position. But if the knife blade is absolutely flat to the butter, a slight bump on the surface of the butter will tilt the knife down into the butter (Figure 21d). Thus, if the skis are absolutely flat in the snowplow, the outside edges may catch and the skier will complete the descent on his face. Now, if the knife blade is edged so that the leading edge is raised a very, very little, it can be stroked over the surface of the butter without catching on its front edge at all (Figure 21b); but if it is edged too much, it will start to pile up butter and will move sideways, along the line of the blade, more easily than it will forward (Figure 21c). Similarly, in a snowplow, if the skis are edged just right they will stroke the surface of the snow and not pile up snow under themselves; if they are edged too much, they will pile up snow for a little and then cross, and the skier once more will be doing a nose plow down the slope.

If the knife-and-butter analogy doesn't ring the bell with you, try, next time you're in the tub, stroking the surface of the water with the

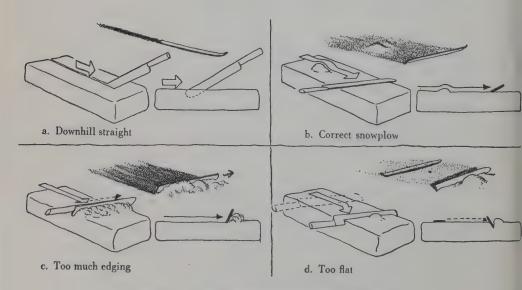


Figure 21 - THE "KNIFE AND BUTTER" ANALOGY.

flat of your hand, tilting your hand at various angles to the water and observing the effect.

Back to you on the snow. Here are the things to remember when doing the snowplow: Toes of skis close together (about a half inch apart), tails of skis spread out in a V, your heels flat down on the skis, knees well bent and weight right smack over the center of the skis, neither forward nor back. Look ahead, not down at your skis, and keep those knees bent. Unless you do, you won't be able to keep an effective V position. You can curve the back a very little. Keep weight and body contour symmetrically arranged and equal on both skis.

Understand it? Ready to try it? Good. Go up your practice hill and start your schuss down. As you begin to slow up on the level runout, force out both heels into the snowplow V, edging the skis very slightly on their inner edges, and hold the position until you come to a stop. If your skis cross, edge less. If the snowplow doesn't slow you down, separate the heels more to make a wider V. If the runout is packed hard or is icy, you may edge a little more. Figure 22 shows a correct snowplow.

Once you've learned to stop your runout on the level, you are ready to start controlling your speed while descending a hill. Go to the top of your hill, start down in good schuss position, and then gradually force out the tails of your skis into the snowplow V. Start your snowplow before you attain full speed in the schuss. Come down the hill in the snowplow, slowly.

Try it again. This time let yourself get up more speed before you snowplow. Start your snowplow gently, so that you slow gradually. Before you get to the bottom of the hill, stop pushing out on your heels and the skis will run back together again, so that you can finish the hill with a schuss. Then snowplow to a stop on the level (Fig. 23).

In doing the snowplow, watch these salient points, which are the most common causes of errors and trouble: 1. Skis must be equally weighted and equally edged. 2. Forearms should be parallel to thighs. 3. Poles should maintain their V position during the plow. 4. Knees should not be locked together in knock-kneed position, or bowed out. 5. Keep tips close together, or plow will not slow or stop you. 6. Edge enough to feel the braking action of skis on snow, but not so much that your skis will ride on their edges and cross. 7. Keep eyes off skis—look ahead of you, at what's coming. 8. And keep your backside flat — try not to stick out in back.



Figure 22 — SNOWPLOW.

- Front.
 Side.
 Back.



2



This is how to know when you're well on the way to mastery of the snowplow: You should be able to come down a fairly good grade in snowplow position so slowly that you can, by widening the snowplow a little, edging a trifle more, and pressing down on the heels, stop at any point.

If you really want to make your snowplow neat and handy, you can employ a refinement called "lift." It will help your snowplow by making it much easier to assume the proper V position, and it will be especially helpful in deep snow. More important still, lift is a major element in advanced technique, and learning it now, at slow, snowplow speed, will repay you many times over in the maneuvers to come.



Figure 22A – WRONG SNOWPLOW.

1. Only right ski plowing; tips of skis are apart. 2. Locked knees; stiff arms pressed to body; overedging; tips touching.

DON'T







Figure 23 - SNOWPLOW TRACK. Note schuss and snowplow alternating.

WHAT IS LIFT?

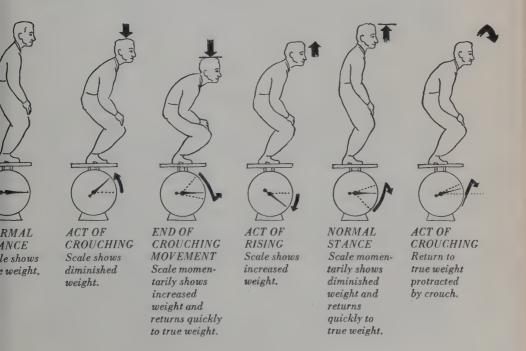
In essence, lift is the momentary unweighting of both skis. It is a rising (or, rather, raising) of the body, followed immediately by a sinking back to the flexed-knee, downhill running position. In the "rise" part of the lift, the body does not come erect all the way, and there is no spring from the feet, as in jumping. The object is to raise and lower the body smoothly in such a way that the skis will momentarily be carrying a lighter load. The load will be lightest at the instant when the "rise" of the lift has reached its greatest elevation, and just as the sinking back to normal position commences. The correct lift is executed by first sinking a little lower (very little lower) than normal running position, then lifting, then sinking back to normal position. It is a measured, smooth, and continuous down-up-down.

To understand the physical principles involved in the unweighting of the skis through lift, consider the man on the scale in Figure 24. In the first picture, he is in normal running position. The scale registers his true weight. In the second picture, he is in the act of crouching lower. During the crouching movement the scale registers less than his true weight. In the third picture, he has come to rest in the crouch

position (that is, the "down" part of the down-up-down which constitutes the lift). As he comes to rest, the scale will momentarily show more than his true weight (because of inertia) and will then show his true weight again. In the fourth picture, he is in the act of rising. During the rising movement the scale shows more than his true weight. In the fifth picture, he has stopped his rising motion. Momentarily the scale shows less than his true weight, then it quickly returns to the true-weight reading. In the last picture, he is starting to crouch again. Now, note this carefully: If, at the moment when the rise stops (fifth picture) and the scale shows less than true weight, the man immediately starts to crouch again, he can protract the length of time during which the scale shows less than his true weight.

It is this period of diminished pressure on the skis (on the scale, in the illustrative example) which one achieves by employing the lift. It is at this time that the skis can most easily be turned.

Figure 24 - LIFT - and the man on the scale.



LIFT IN THE SNOWPLOW

To get back to the snowplow. Try the following when you want to go from schuss to snowplow: As you are on your way down the hill, decide the exact spot where you want to start your snowplow. As you approach the spot, sink down a little lower, then lift — and then, at the exact moment when your "rise" has reached maximum, form your V. The skis will be virtually unweighted as you heel out into the snowplow position, and they will freely and easily stroke the snow, instead of forcing their way through it.

And now you are skiing. You are in control. That is one of the major thrills of the sport, and as you ski more and witness the antics of other skiers who risk their skins and yours by swooping down a slope willy-nilly, wherever their skis carry them, you will understand why the real skier is he who can make his skis obey his will.

The next steps in the skiing progression are the downhill turns, but before we go on to them let us consider some of the dynamics of skis on snow, and of the human body while skiing. Understanding these underlying principles will make learning faster and easier.

DYNAMICS OF SKIS AND SKIING

The entire realm of skiing divides itself into two parts, straight skiing and turns. Straight skiing — that is, walking and schuss — is used to cover ground. Turns are used to change direction, to maintain control, and to alter speed.

As has been said, the correct schuss position is with the skier's center of gravity centered on the skis; that is, with his body at right angles to the slope. Another way of saying this is that a straight line drawn through the axis of the schussing skier's body should be at right angles to the slope on which he skis. We have stressed flexibility of the knees, which are the key to skiing correctly, and their importance is apparent in considering this matter of keeping the weight correctly centered. Suppose you are going down an uneven slope, with rises and dips. If your knee action is correct, your shoulders should "draw" a straight line



Figure 25 - BUMPS AND DIPS.

parallel to the slope while your knees take the unevenness in the surface (Figure 25). Vorlage, the forward lean, must not be overdone. If you are too far forward with your weight, the body's hinges (ankles, knees, hips) have to be set rigidly to maintain the position, and should your skis strike a patch of loose snow which slows them abruptly, you would pitch forward and fall. On the other hand, if your weight is too far back, you are in constant danger of being left behind by your skis. Correct stance, correct vorlage, means the maintaining of a free, loose-jointed posture, vertical to the skis, so that you can respond to every variation in terrain.

Finer points will come to you automatically with practice, things such as the deeper crouching you do temporarily when lateral balance is threatened, but the prime principle of straight skiing is the easy, relaxed, balls-of-feet stance (without actually lifting the heels from the skis), with plenty of spring in the knees.

We have talked of the right angle made by the skier's body and the slope. There is another important right angle involved in skiing, and one which is too little appreciated. That is the right angle the leg forms with the cross-section of the ski. Or, to put it more plainly, a straight line joining knee, shin, and ankle is at right angles to a line drawn through the ski from edge to edge.*

Study Figure 26. On the level, the ski is flat and the leg upright, forming a right angle. Standing or skiing on the side of a hill, the skis

^{*} This rule does not hold for the stem position.

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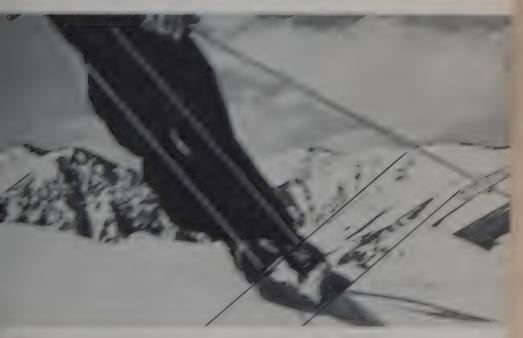
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else fails, are contrary to the best interests and fastest development of a thorough skiing technique, capable of use under all conditions, safe, secure, and scientifically sound.

Now let us consider the matter of skiing turns.

There are three families of turns in skiing: static turns, slow-speed turns, and swing turns.* The static turns are used solely for changing direction. The slow-speed turns are used for changing direction and decreasing speed. The swing turns are used for changing direction and maintaining control at high speeds. (You already know the static turns, those done while not in forward motion. They are the step turn and the kick turn.)

It is when forward motion, centrifugal pull, and the force of gravity pulling downhill act on the skis and skier that new elements enter the picture. They are not many, and they are easy to understand. A ski dropped on a hillside and allowed to slide away will take the shortest way down a hill. This line is called the fall line. When you schuss straight down, you are following the fall line for that particular part of the hill. When you ski at an angle to the fall line, whether uphill or down, you're traversing. In a slow-speed turn, you turn away from the fall line if you have been skiing in it, or toward it if you have been skiing a traverse. The slow-speed turn is initiated by unweighting one ski somewhat, placing it in the direction you want to go, then putting most of your weight on it and riding it. Some lift and a rotation of the shoulders are used to make the skis turn. Slow-speed turns are of fairly short radius.

Swing turns are usually of wide radius and remain fairly close to the fall line, crossing it from side to side. They can, however, be of very short radius, sharp and abrupt. Swing turns are accomplished mainly with the body, with shoulder rotation and exact knee action. Lift is used to unweight both skis simultaneously, so that the turn can be started with both skis parallel (except in the stem christiania, in which the turn is initiated with the stemming of one ski). The swing turns can be done only at considerable speed. (For a diagrammatic visualization of the various turns, see Figure 27.)

^{*} There is another group of turns, the steered turns, which will not be taken up in this book. They are the telemark and the open or scissor christiania. These turns are rücklage turns, hence they are unstable. The telemark requires raising the heel from the ski, to which modern bindings do not yield easily, and the scissor christiania can be perilous at higher speeds. Neither turn is a necessary part of the good skier's repertory.

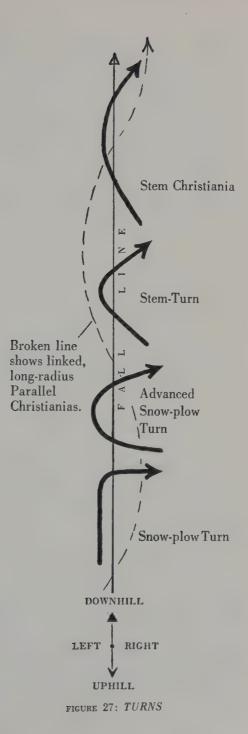


Figure 27 — TURNS.

You have undoubtedly seen spectacular action photographs and movies of the high-speed swing turns and may be dismayed at the prospect of trying to learn to do them. Be reassured and be happy. The very first slow-speed turn you are going to learn, and the most basic and fundamental turn in the building of a sound skiing technique, is also the one which, properly executed, duplicates at slow speed the body and shoulder motions of the tempo turn, the fastest, prettiest turn of them all. It is called the snowplow turn, and the more time you spend on it, the more rapid your later progress will be. It has the beauty of being learnable bit by bit; that is, you can learn the elements involved one at a time, while performing it.

SNOWPLOW TURN

Remember how you did the snowplow? The weight was equal on both skis, the body symmetrical. Now do a slow snowplow on your practice hill, and shift the weight onto one ski. You will promptly turn. This is not a snowplow turn yet; it is turning while doing the snowplow, which is quite different, but it is a turn, your first while in downhill motion.

Suppose you want to try a turn away from the fall line to the right. Start straight down the practice hill with your skis in the snowplow position. Now shift all your weight onto your left ski, at the same time edging it a little more on its inside edge. You will make a right turn. The reason is simple: in the snowplow position, the left ski is pointed across the slope toward the right. If you put all your weight on it, it will carry you in that direction.

Similarly, for a left turn, put all your weight on your right ski.

In these turns, the weighted, outside ski should move two to three inches ahead of the inside ski, while the points are kept close to each other throughout the turn — that is, preserving the V.

For some people, the weight shift and the turning are stubborn matters to learn. If you experience difficulty, there is a strong likelihood that one or more of the following pointers will help you out.

Both knees must be bent, that is flexed, yet they must be limber, not locked in position. The outside knee must be bent the most, but the

inside knee must be sufficiently bent to keep the inside ski from edging sharply, which would cause it to cross the outside ski. A common failure is inability to transfer the weight to the outside ski. Most frequently, this is brought about by a mistaken notion that proper weight shift can be accomplished by tilting the pelvis, thus getting the hip over the ski to be weighted. This is absolutely wrong; the hips and shoulders should remain symmetrically centered with respect to the spine. It is the flexed knee which must be placed directly over the ski to be weighted. Another frequent cause of the same failure is a misguided attempt to press the outside ski of the turn into the snow by muscular force, instead of weighting it. Of course, in pressing a ski into the snow one's body is pushed away from it, so actually the weight will end up over the other ski.

If the weighted ski does not turn, but merely goes straight in the direction it's pointed in, you are edging it too much. If the inside unweighted ski does not follow around the turn, it is edged too much, most likely because the knee has straightened and stiffened.

Don't jerk your weight over, don't jump onto the ski you want to weight, but gradually get all your weight over in a smooth, fluid motion. It is important to maintain the snowplow throughout the turn, with tips together and the skis and body turning as one unit.

ROTATION

The next element we introduce into the turn will make it much easier to get around, and a complete and rather nice-looking turn will result. Furthermore, this new element is going to be of great importance later, in the more advanced slow-speed turns and in the swing turns. It is called rotation. Rotation is, in essence, the pivoting of the shoulders in the direction you wish to turn.

On your first attempt to use rotation in the snowplow turn, choose a part of the slope with which you are familiar and on which you have successfully executed turns with weight-shifting alone. Start down in the snowplow position and hold it until you are descending the hill at uniform, fairly slow speed. Start your weight-shifting in the usual way, and as your weight commences to come over the ski which guides

the turn, slowly rotate your shoulders around in the direction of the turn. This movement, which is done slowly, over the full length of the turn, is a smooth rotation of shoulders and upper body, with emphasis on the shoulders, so that as they rotate they seem to pull the body around.

Suppose you want to make a right snowplow turn. You are moving down the slope, in full control, at uniform speed, in snowplow position. Start shifting your weight onto your left ski. Simultaneously, begin the pivoting rotation of shoulders and upper body. Don't jerk around with the upper body, but co-ordinate weight shift and body rotation smoothly and easily, synchronizing them in such a measured way that the rotation is made to last throughout the turn. Maximum rotation should be achieved at the same instant that the turn is completed, not before.

It is essential, in employing rotation, to flex the knees, bending into a deeper crouch than that used in the snowplow with which the turn was commenced, making sure that in flexing the knees the seat is not thrust out behind, nor the hips shifted to the outside of the turn. The rotation and knee action together make one "around-and-down" motion.

Important, too, is the correct position of hands and arms. The arms and hands turn naturally and freely with the shoulders. In the straight snowplow position, the hands are near the knees, one fist over each ski, the poles in a V out behind you, points just clear of the snow, forearms and thighs parallel. At the end of the rotation of shoulders, i.e., at the end of the turn, the arms have moved with the shoulders, so that the hand on the inside of the turn is over the rear part of the inside ski, and the hand on the outside of the turn has moved a little forward and around until the knuckles point at the tip of the outside ski (Figures 28 and 29).

USING LIFT IN THE SNOWPLOW TURN

Now comes the final refinement of your snowplow turn. It will make the entire turn easier, neater, and more directly valuable in preparing yourself for the faster turns to come.

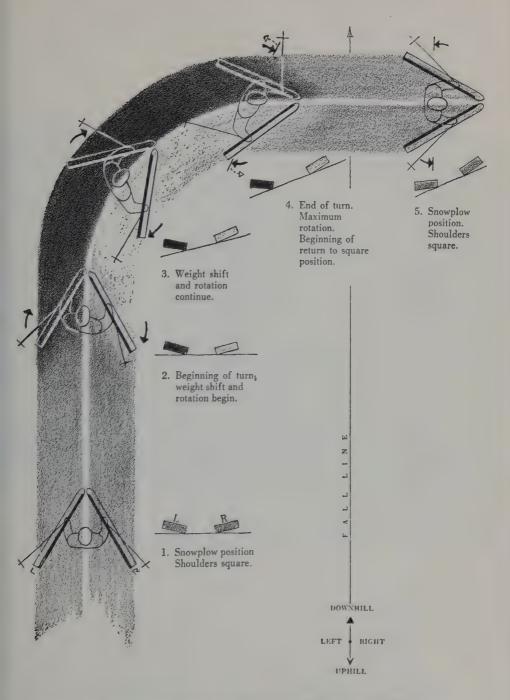


Figure 28 - SNOWPLOW TURN WITH WEIGHT SHIFT AND ROTATION.



Figure 29 - SNOWPLOW TURN. 1. Snowplow. 2. Weight shift and rotation.



Just before you start the simultaneous shifting of weight and shoulder rotation, use *lift*, the same lift you learned to use in starting the straight snowplow. This is the final perfection of the snowplow turn from the fall line.

Here is the perfected turn, analyzed step by step: You are coming down the fall line in straight snowplow position. You select the spot where you want to start your turn. As you approach it, lift. At the height of the lift, and just as you are ready to start sinking down again, you simultaneously start your rotation and weight shift. As the turn progresses, you continue to sink down into the crouch position, and this sinking and the shoulder rotation must synchronize smoothly. The knees continue to bend as you approach the end of the turn, and the shoulder rotation continues. At the end of the turn the shoulder rotation ceases, having reached maximum, and the knees are rather deeply flexed. Don't stop there; this is the point at which the weight comes back on both skis, the shoulders turn back to normal position, and the knees straighten somewhat so that you return to the same straight snowplow position you started with, but turned ninety degrees from the fall line.

Study the perfected snowplow turn as shown in the drawing, Figure 30. Note, especially, the position of hands, the rotation of shoulders, the weighting of the skis.

The phases of the right turn are: 1. Straight snowplow down the fall line. Shoulders square, weighting and edging of skis equal. 2. Now lift — and weight shift and rotation of shoulders commence. Outside (left) ski edged a little more than in 1, inside (right) ski, a little less. 3. Weight has shifted and rotation continues. Skier is still sinking down from lift. 4. Maximum rotation and maximum crouch have been reached. 5. Shoulders and knees return to normal, symmetrical position, and weight and edging are equal on both skis. Figure 31 illustrates, better than words can tell, the most typical snowplow-turn errors.

LINKING SNOWPLOW TURNS

Now you are ready for some fun. You can, by connecting a series of snowplow turns, descend an entire slope in a series of linked S's.

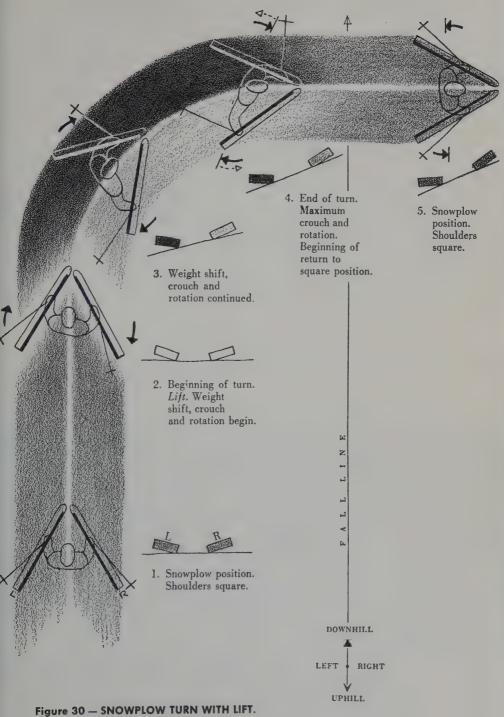




Figure 31 — SNOWPLOW TURN ERRORS. 1. Skier bent over from waist; ski tips too far apart; knees stiff; downhill shoulder is dropped. 2. Downhill ski pushed ahead; inside knee stiff; inside ski overedged. Sure results: crossed skis, no turn, DON'T a fall.

2



That is interesting to do it is though mountral, it is far less tiring as a means of manuscring uniform now speed down a hill than the straight thouspure. It will also render you expand of dealing safety and neatly with steeper, longer hills.

To the mosspios time start down your practice full in snowplow product, execute a snowploss time (using weight shift, lift, and rotation, and end it properly with a limbs deeper crouch than straight downfall product required, and with your rotation completely expended from material of just straight your shoulders back square and returning to normal crouch you immediately instate another turn, in the appoints direction. Hold your showplow position, use your crouch to get good lift for the start of the new turn, and simultaneously start your lift, weight shift, and rotation of shoulders. When this second turn is coming to completion start your third, in the same way that you started your second out, of course, in the new direction.

Using these linked snowplow turns you can descend the entire slope in a series of turns which tross and recross the fall line. Try to make them in mythin, as if doing them to music, making the end of one turn and the beginning of the next turn flow together, without while pause, without perking. The synchronizing of lift, weight shift, and rotation—lift, weight shift, and rotation—is extremely important and worth considerable practice. Notice the easy, fluid quality of the linked turns in Figures 32 and 33. Study the diagram and drawing in Figure 34.

Lunking showplow turns that you discover something wonderful, a free dissidend for all your work and practice. The end phase of your first turn leaves you all set to start your second turn. Having used up, in the first turn, your full shoulder and body rotation, you are all set to rotate in the opposite direction in the second turn. The end of the first turn is actually a winduction the second.

This windup (called counter-rotation) is of vital importance in all turns to come. We are giving to learn to execute it intentionally, in unlinked turns, when we come to use advanced showplow turn. Before we trait learning this turn, however, we have to take up, again, our old friend the traverse. This time, the tired skier will be pleased to learn, we are going to traverse downtall, with gravity instead of muscle doing the work.

Figure 32 — LINKED SNOWPLOW TURNS. 1. Snowplow. 2. Weight shift and rotation. 3. Ending of turn to the right. (Note left ski is in lead.) 4. Shifting weight to right ski for left turn. (Note right ski coming into lead.) 5. Ending of left turn.



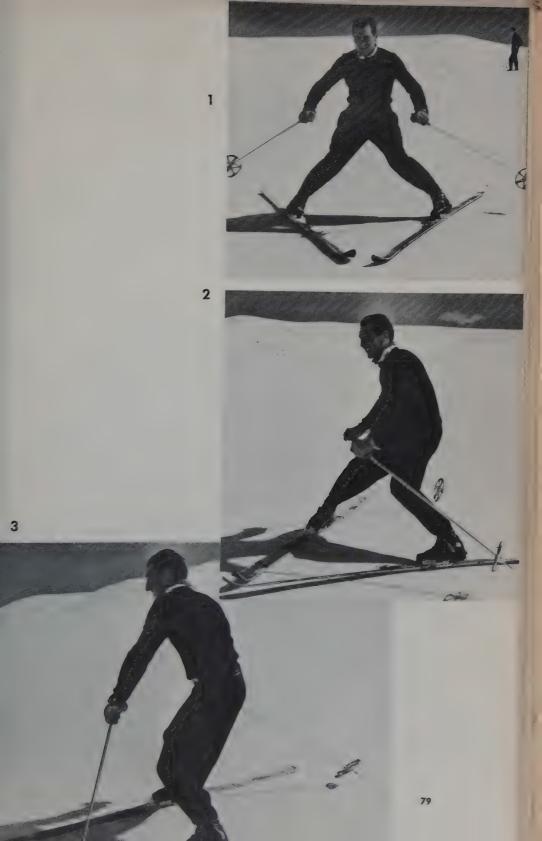


Figure 33 — LINKED SNOWPLOW TURNS. 1. Skier starts down. 2. Approaches camera. 3. Passes camera. 4. Links them neatly and in rhythm. 5. Comes to stop with straight snowplow.



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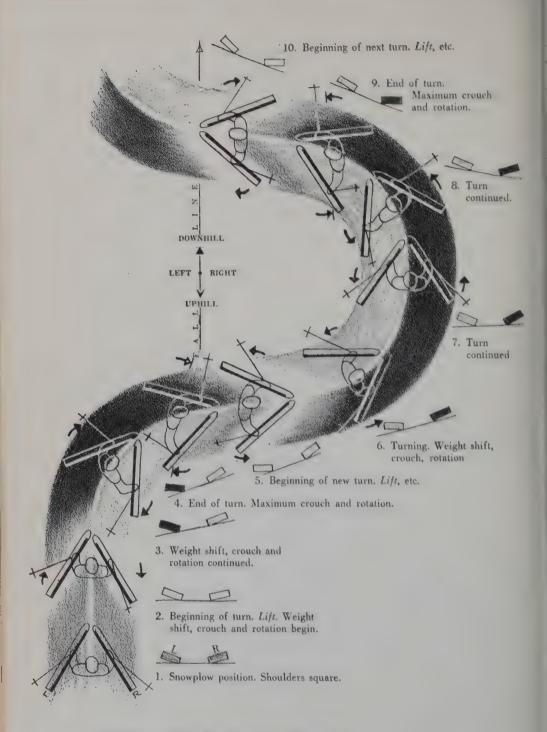


Figure 34 — LINKING TWO SNOWPLOW TURNS.

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CHAPTER IV

Descent plus Control

By now you should be able to snowplow and snowplow-turn from the fall line with ease, with confidence, and at will. You are ready for steeper hills, then, and you may not want to tackle a new, more abrupt slope for the first time head on, in either snowplow or schuss position. Your method of descent, therefore, will be in a series of downhill traverses. Do you recall the plodding uphill traverses, zigzagging up the hill with kick turns between the zigs and the zags? In traversing downhill, you also zigzag, but it's easier, and in place of the kick turn to change your direction you use the advanced snowplow turn.

TRAVERSING DOWNHILL

For your first traverse, start either at the top of that ideal practice hill we talked about, the one which has a top right where you want it, or start from a standstill partway up the kind of hill you're more apt to be coping with. On such a hill, you stand across the slope — that is, with skis at right angles to the fall line. Brace yourself against sliding with your poles, then step around a little until you're pointing your skis somewhat downhill, at a diagonal between the fall line and the horizontal. Keep your skis parallel and edge them on their uphill edges (toward the slope) as you did in the uphill traverse. Advance the

uphill ski about two inches. The weight is nearly equal on both skis, although the downhill ski bears a little more of the weight than the uphill ski. (Remember, the greatest stability results from skiing on both skis as much as possible.)*

Now, let go with your poles, and you start to angle across the slope, losing altitude as you go. This crosswise traveling, in which you cover distance laterally while you gradually descend the hill, is called traversing downhill.

Suppose you want to traverse down a hill from its upper left side to its lower right side. The left ski is on its inside edge, the right ski on its outside edge. Skis quite close together. Right ski one or two inches ahead of left ski. Weight virtually equal on both skis, although the left (downhill) ski carries a little more weight than the right. An important thing to bear in mind in traversing is that the knees must be limber and pressed very slightly inward, toward the slope. That is the *only* way you can edge comfortably and sufficiently to keep from slipping sideways. But don't "lock" your knees. That is the most common fault and the most fatal to a proper traverse.

The body is vertical, with shoulders square and level; you must stand upright on the skis. It is hard to bring yourself to do this, since you instinctively try to hug the slope with your body, but you will soon discover that stability on skis very frequently lies in the direction of thwarting your instincts. Study the photographs in Figure 35 to see how the experts perform the traverse. You might also profit by looking at the skier in Figure 36. The ski gremlins have overpowered him utterly; he is making all the beginner's mistakes. (Out of finer feeling, we are not showing you the next picture, in which our poor friend is at the bottom of the slope, having made the trip down on his left side, also his right side, also his back, his stomach, his head, his seat — in fact, everything but his skis. It is a fast way down, but it's unpredictable, tiring, snowy under the ski jacket, and it somehow lacks style.)

^{*} The tendency of beginners who are learning to traverse is to try to hug the slope out of fear of the terrifying void which experts assure them is only a gentle practice slope. This fear leads them to place most of their weight on the uphill ski, a sure way to fall. To overcome this fault, teachers drill their charges in the idea of always weighting the downhill ski. As a result, many beginners have the mistaken notion that they must ski only on the downhill ski, the uphill ski going along just for the ride.



- 1. From the front.
- 2. From the back.

EDGE CONTROL AND SIDESLIPPING

Before going on to the more advanced turns (advanced snowplow turn, stem turns and even the high-speed turns) we'll take what may seem to be time out to practice a maneuver which is not only advantageous in developing the ability to ski under full control, but also has within it motions of the body and maneuverings of the skis which





Figure 36 — WRONG DOWNHILL TRAVERSE. 1. Knees locked, skis apart. 2. Lower shoulder dropped; skis apart; uphill ski weighted, hips tilted toward the slope. (Note, in No. 2 particularly, stress and strains in all directions. Besides being unstable, skiing this way is terribly hard work.)

are essential to further progress and to the ultimate mastering of a complete, modern ski technique. In order to do this, we'll pick a nice smooth slope of good gradient, and preferably packed. Stand across the slope — that is, at right angles to the fall line — with skis close together and parallel, edged into the slope to maintain your position. Upper ski about three inches ahead, weight equal on both skis.

You've already learned lift and its advantages in momentarily unweighting the skis. In your standing position assume the crouch which precedes lift; then lift and simultaneously release the edges of the skis so that they proceed down the fall line at right angles to it, remaining parallel and close together, sliding over the snow — sliding down sideways. Then go into the crouch position as you edge to stop.

The first time you try this, it may be rough and jerky, it may seem hard to keep the skis parallel, and the tips or heels may tend to turn toward the fall line. Very soon, however, you will learn that by shifting your weight forward or back you can keep your course down the fall line with tips and heels even — that is, at the same altitude — and you will be able to keep the skis together and parallel. See Figures 37 and 38.

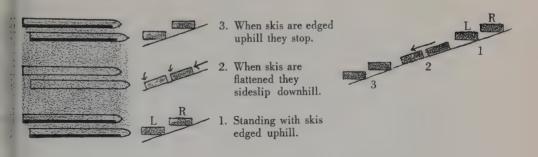


Figure 37 — CONTROLLED SIDESLIP.

1. Standing on slope. 2. Release edges and sideslip. 3. Edge to stop.



Figure 38 - CONTROLLED SIDESLIP.



Once you have mastered the process of crouch-lift-and-release — sideslip — crouch-and-edge, you are ready to do a series of sideslips in rhythmic motion, in which the crouch that commences a slip and the crouch that terminates it (with the edges biting in) lead smoothly into each other in a progress which might be described thus: crouch, lift and release edges, crouch and edge, lift and release edges, crouch and edge, etc., with slips between each pair of crouches.

When you have learned to do this rhythmically, smoothly, easily, you are not only ready to learn the advanced snowplow turn, but you have gone a long way toward perfecting a type of body, ski and edge control which will be invaluable to you as you go on into advanced technique.

A few important pointers will make your progress in the controlled sideslip easier. First, refer to Figure 21 again to see how releasing the edges too much may result in your catching the downhill edges and falling. Although the released edges bring the surface of the ski virtually flat to the snow, there should still be a slight amount of edging, just enough to keep the downhill edges from coming into contact with the surface of the snow and possibly catching, to throw you into a spill. Another important point to remember is that the releasing of the edges should not be accomplished by holding the feet and ankles rigid and releasing from the knees. Knees and ankles, with emphasis on the ankles, are the parts of the body that come into play in releasing the edges and in re-edging to stop. Finally, although the object of all good skiing is to ski on both skis equally, as much as possible and whenever possible, in this kind of controlled sideslipping in which one edges to a stop it will be easier to make the

stop clean and the edging precise if the downhill ski has a little more weight than the uphill ski at the time of edging.

ADVANCED SNOWPLOW TURN

The advanced snowplow turn differs from the snowplow turn in four major respects. First, it is done from a traverse and toward the fall line, instead of away from the fall line. Second, counter-rotation is employed in the starting of the turn. Third, the turn is almost 180 degrees instead of 90 degrees; that is, one turns from a traverse in one direction all the way around to a traverse in the opposite direction. (The snowplow turn, you will recall, turns only 90 degrees away from the fall line.) Fourth, the skis are allowed to run together — parallel — at the completion of the turn.

Now we must consider the matter of counter-rotation (which we "discovered" in linked snowplow turns) and its correct execution, and then we can get on to the advanced snowplow turn itself.

Let us observe, for a moment, a few other sports.

You know how a baseball batter swings the bat back before smashing at the ball? How a tennis player takes back his racket before making a forehand drive? How a golfer swings the club back before lacing into the ball to send it on its way in a long drive? In skiing, this windup, this act of getting set and giving yourself room and momentum for your rotation, is called "counter-rotation."

How do you use counter-rotation to precede the actual turning in the advanced snowplow turn? It's easy. In a right turn from a traverse to the left, you want to rotate your body to the right. Before doing so, get your windup by a counter-rotation of the shoulders; that is, pull your left shoulder back, back far enough so that it turns your shoulders and begins to pull your body around toward the left, too. That's your windup, your counter-rotation. Now, when you start your weight shift to the left ski, and your shoulder rotation to the right, you'll have plenty of room in which to pivot your shoulders and your rotation will last throughout the turn. The position — or, rather, the motion — of hands and arms is important, too. In counter-rotation the uphill arm and hand turn with the uphill shoulder, so that in full counter-rotation the uphill hand is directly over the rear part of the ski. Similarly, the downhill hand moves around and forward.

Now that you understand counter-rotation, and know how to use rotation, you are about ready for the advanced snowplow turn.

Start traversing down the practice hill. Traverse at least thirty feet. Lift a little, to help get the skis into snowplow position. Hold the snowplow for at least fifteen feet, then counter-rotate the shoulders and at the same time sink a little lower down, remembering not to squat, but to flex knees and ankles. Now, simultaneously, start lift, start rotation, start weight shift — in other words, start turning toward the fall line. Just before the turn comes full around — that is, when you are at the proper traversing angle (in the opposite direction from your original traverse) — let the skis run together, close and parallel, and as they do so, bring the shoulders back square and advance the inside (uphill) ski of the turn two to three inches.

Traverse, now, in the new direction, again for at least thirty feet, then snowplow, advanced-snowplow-turn, and again traverse. Continue in this way until you get down the slope in a series of traverses joined by advanced snowplow turns. Do this many times, until you can start in either direction, traverse in either direction, turn from a traverse in either direction, all with equal ease and with a sense of mastery and freedom from anxiety.

Figure 39 shows the correct way to link traverses with advanced snowplow turns. Figure 40 is a step-by-step picture of one advanced snowplow turn.

Here are the steps in a right turn, as they are shown in Figures 40, 41, and 42, analyzed one by one. Remember, they are not executed in steps, but are all done in one flowing, synchronized movement. The step-by-step analysis can only "stop" the action for you at various phases of the maneuver, so that you may better understand what happens and when.

- 1. Traverse: Skier is in traverse from upper right of the hill toward lower left. Shoulders square, weight on both skis (although the right ski carries a very little more weight than the left). Left ski is leading right by one or two inches.
- 2. CROUCH: Skier crouches slightly, and
- 3. LIFT AND SNOWPLOW: Lifts in order to make an easy snowplow.
- 4. Counter-rotation: Snowplow position is held while skier counter-rotates shoulders and simultaneously crouches a little more than normal traverse position requires. Both skis are still on inner edges, as in straight snowplow.



- 5. ROTATION: Lift, weight shift, and rotation commence simultaneously.
- 6. In Fall Line: In the fall line, rotation has progressed to halfway point and shoulders are now in symmetrical snowplow position. Sinking into crouch, which commenced as weight went onto left ski, continues. Right ski is flattening (in preparation for edging on right edge).
- 7. ACROSS FALL LINE: Rotation nears maximum.
- 8. MAXIMUM ROTATION: Maximum rotation and maximum crouch are achieved. Turn is virtually complete.
- 9. "UNWINDING": As skier starts to rise from crouch, right ski begins going over onto its uphill edge and skis begin closing (running together). At the same time shoulders begin to "unwind."
- 10. Traverse: Traverse again. Skis parallel and close together, right ski has come into the lead, weight nearly equal, shoulders square, normal bend of knees, both skis on uphill edges.

Once you have mastered traversing and the advanced snowplow turn, you are ready for a refresher demonstration of your skill, either to test yourself or to show off to admiring novices, since you are no longer a novice.

Put on your skis, walk to the practice slope, start up in traverses with kick turns between them. When the hill gets steeper, shift to the half side step, and when the going gets tiresome that way, or if the width of the hill narrows, switch to herringbone. Use the side step for the final ascent. Start down the fall line in a schuss, snowplow, link a few snowplow turns, traverse, advanced-snowplow-turn, traverse again, advanced-snowplow-turn, traverse to the center of the slope, then snowplow position, then let skis run together and schuss the rest of the slope, stopping with a snowplow on the level.

Nice going! But you're even better than you realize. Those advanced snowplow turns between traverses are very closely related to stem turns. And you're ready to learn the stem turn now. But that isn't all. By virtue of having learned the right way, you can now look back, not too far, to first steps on skis and realize that from now on everything is largely a matter of refinements and improving technique. The fundamentals are already learned and behind you — or, rather, with you, for you'll use them all the time. There has been no waste motion.

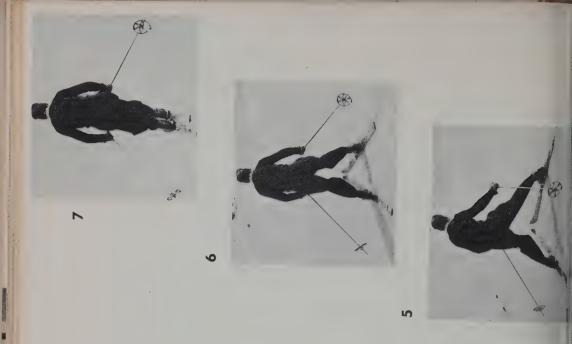
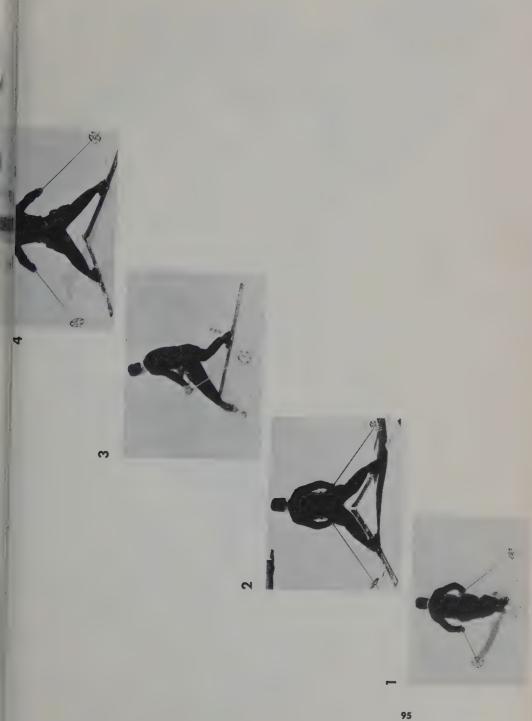


Figure 40—ADVANCED SNOWPLOW TURN ANALYZED. 1. Traverse. 2. Snowplow. 3. Counter-rotation. 4. Starting to lift, shift weight, and rotate. 5. Turn begins. 6. Finishing of turn. 7. Skis running together, uphill ski moving ahead.





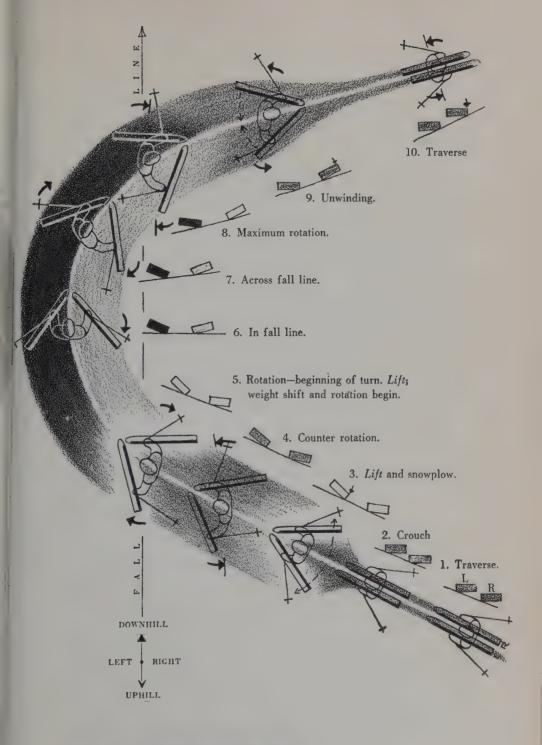


Figure 42 — ADVANCED SNOWPLOW TURN.

DO'S AND DON'TS

Do, in traversing, keep skis close together and parallel, with (important) the uphill ski always a little ahead.

Do, in traverse, employ equal edging and virtually equal weighting.

Do stay in the snowplow long enough to get completely set, when turning from a traverse.

Do come into a full traverse, with skis together, before starting a new turn.

Don't lean toward the hill when traversing.

Don't drop either shoulder.

Don't try to break speed in a traverse with the edge of your uphill ski.

Don't let the skis run together until you are sufficiently far around in your turn for the next traverse.

Don't push the outside ski of your turns ahead too far. If you do, the inside knee will straighten, and the skis won't run together easily, at the end of the turn.

CHAPTER V

The Stem Turns

The stem turn differs from the advanced snowplow turn in two principal respects. (1) It is made at algoer speed (i.e., the traverse from about it is made in closer to the fair line), and (2) the skis, instead of teing stemmed (that is, pressed out at the heels into the snowplow) simultanes also, are stemmed separately, first the downhill ski, then the uphill ski.

STEM TURN

The following is an analysis of a stem turn to the right.

- 1 Skier is in a traverse, from upper right of hill toward lower left. The traverse is steeper (closer to the fall line) than any previously used, and the akier has more speed as a result.
- 2 Simultaneously counter-rotation of shoulders and stemming of right (downhill) ski.
- 3. Weight is carried now on stemmed right ski while left ski is stemmed.
- 4. As left ski attains full stem position, skier lifts, and starts rotation to the right and weight unit to left ski.
- 5 Sk: tipe are kept close together (by maintaining outward pressure on near) at skier approaches fall line. In the fall line the skis and tody and anothers are in symmetrical, anotaplow position, although weight is on left ski.
- 6. As fall line is passed, and rotation continues, the right ski is allowed to run together with the left. As the turn finishes in the new traverse the right ski goes over onto its upuil edge and the skis come parallel and close together, with right this in the lead.

Throughout the turn, hands and arms move freely and naturally with the shoulders, as in the showpion turns.

STEM TURN WITH REFINEMENT

Now we introduce a refinement into the stem turn. This is not always taught to beginners, but it is extremely useful for making a neat stem turn in deep or powder snow, and in addition it is invaluable in executing the faster turns to come.

You may have noticed that the stemming of the downhill ski (the ski on the inside of the turn) is sometimes difficult, especially if the snow is deep enough to offer resistance to the sideward pushing out of the heel. In addition, the act of stemming this ski (called counterstemming) may reduce the necessary speed for making a nice smooth turn. To make counterstemming easy, and to prevent it from retarding forward motion, we use the following refinement of counterstem and counter-rotation:

The skier is in traverse, weight virtually equal on both skis. He selects the point at which he wants to counterstem. As he approaches it, he crouches down a little. He then lifts. At the moment when the highest elevation of the lift is reached, both skis are somewhat unweighted. Now, as the sinking down after the lift commences, the returning body weight is taken up on the outside (uphill) ski, and simultaneously counterstem and counter-rotation are begun. As the counterstemming and counter-rotation approach completion (while the shoulders are still counter-rotating) the weight is brought onto the stemmed, downhill ski, so that in the crouch at the end of the sinkingdown movement the counterstemming and the counter-rotation are completed, and the uphill ski is relieved of weight. This is the favorable time to stem the uphill ski. When it is sufficiently stemmed the skier simultaneously starts the rising phase of another lift and weight shift and rotation. He then executes the balance of the turn in the usual way, using the around-and-down movement which is a combination of rotation and sinking from the lift into the crouch.

The explanation of this refinement sounds extremely complicated. Actually, it is a very simple matter, once understood, and is done with even and smooth-flowing motion, in which the various movements — lift, counter-rotation, counterstem — separately described, are all integral parts of one continuous movement, which we call *countermotion*.

Now we are ready for a word-and-picture analysis of the stem turn with the refinement (Figures 43 and 44).

1. Traverse: Steeper and faster than in previous traverses.

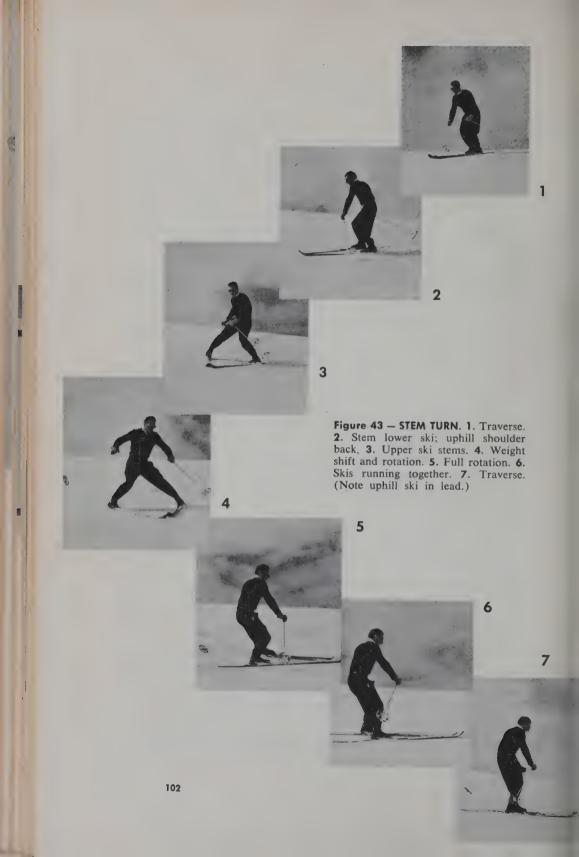
- 2 Crowch Benc forward from kneer, seat pulled in Don't sit.
- 3. LIFT: Both skis "weightless."
- 4 Countermotion. At the end of lifting, weight comes down on upon ski. Start of sinking down in crouch is accompanied by start of counterstem and counter-rotation.
- 5. Shew At the end of countermotion, weight comes full on stemmed (downs...) ski. The outside, uphili ski is now nearly weightless and a stemmed. The downs.il ski is already stemmed, and the shoulders are "wound up." Body is crouched and ready for lift.
- 6. LIFT.
- 7 Wescert Services and Posterion: The instant when highest elevation in the lift is achieved and the unking down is about to begin, rotation and weight shift to uphill (outside) ski are begun.
- FALL LINE: Potation has progressed to halfway point, so that in the fall line the akier is in straight snowplow position, but with the weight alreads full on the outside ski.
- 9 START OF CLOSE: As skier crosses the fall line and as the outside ski of the turn comes into line with the intended traverse in the new direction, the skie start to close, the inside ski coming parallel with the outside ski and moving ahead into the lead as it does so. The edging of this ski simultaneously changes to the uphill edge. Meanwhile, full crosses and full rotation have been achieved, so that as the skie start to close, the skier rises to normal posture for the traverse and shoulders come square over the skie again.

10. TRAVERSE IN NEW DIRECTION.

Study the photographs of the stem turn carefully, noting skis, hands, poles, ankles, knees, body, shoulders — and the changing of the edging on the inside sk; of the turn. Note, too, the path carved by the skis.

It is important to practice stem turns on different hills, at different speeds, from traverses of various angles. Learn to make a smooth descent of hills which are not too steep, placing your stem turns and traverses where you want them. You will discover that the degree of stemming of the lower ski depends on the steepness of the slope and the depth of the snow, and you will accustom yourself to gauging your requirements. The degree of stemming and the amount of lift are also influenced by the speed at which the turn is entered.

Don't attempt to link stem turns; they are meant for joining traverses. Don't hold your snowplow position, in which both skis are stemmed, as soon as the uphill ski is in position, go right into your turn.



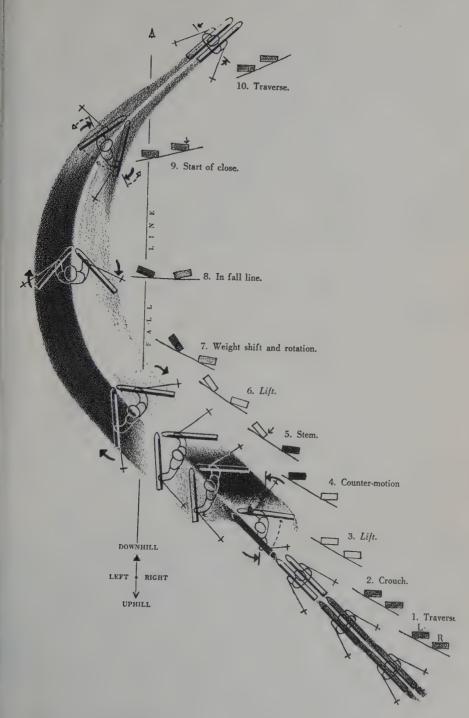


Figure 44 — STEM TURN.



Figure 44A — WRONG STARTING OF STEM TURN. The position (corresponding to No. 2 in Figure 43) is so bad as to doom the entire turn. The stiff lower knee has thrown the weight on the uphill ski, and the skier, in attempting counterrotation, has leaned in toward the slope. In addition, the stance is too erect and rigid.

ADVANCED STEM TURN

The advanced stem turn differs from the stem turn in one major respect. The skis, instead of being allowed to run together by themselves at the end of the turn, are intentionally closed; that is, the inside ski of the turn is drawn parallel with, close to, and a little ahead of the outside ski. In order to accomplish this with finesse and ease on packed slopes, and without undue muscular strain in deeper snow, lift is used to relieve the pressure of the body's weight on the skis.

The advanced stem turn is a rather "tight" turn, a turn of short radius. It is done at moderately good speed, and it requires good rotation to overcome centrifugal pull in the turn, and the pull of gravity along the fall line. The first phases of the turn are similar to those for the stem turn, and the position in the fall line is, again, instantaneously, a symmetrical snowplow with the weight on the outside ski. Speed is a little greater, lift a bit more pronounced, the crouch toward the end of the turn a little deeper. As the outside ski comes into the direction of the new traverse, the skier simultaneously starts the following four motions: (1) lift; (2) "unwinding" of shoulders; (3) turning of the inside ski of the turn onto its outside (uphill) edge; and (4) drawing of the inside ski parallel, close to, and into the lead of the outside ski. The turn ends with body returned to normal traverse position, shoul-

ders square, both skis on their uphill edges and parallel, the uphill ski leading the downhill ski by a few inches, and the weight equal on both skis.

The degree of stemming of the downhill and uphill skis, particularly the latter, depends on speed, obliquity of the traverse, quality of snow. The correct amount of stemming cannot be taught; it is a matter of "feel," which is developed automatically through practice.

A properly executed advanced stem turn is shown in Figures 45 and 46. Study these photographs and also the diagram in Figure 47. When you have learned to adjust the timing and synchronization of movements in the advanced stem turn to suit various slopes and speeds, and have learned the fairly rapid closing of the skis after the fall line is passed, it's time to get out the family movie camera and take a picture of yourself coming down a slope in traverses linked with stem turns. You'll be proud of those pictures and so will we.

The advanced stem turn can be tricky to master in the end phases, where the skis must be closed, lift must be right, and the inside ski changes its edge, but once you learn it you'll be right next door to the most exciting family of turns in all skiing, the christianias. There's magic in the name, and magical is the sensation of doing them. Magical, too, will be the way you look on skis when you've mastered the christies, as they're called.

And don't forget, right now you're next door to them, and the door is ajar. Before learning how to open it, though, it's advisable to get a little better acquainted with your skis. Once you do, you'll feel the security which is essential to the greater speeds called for by the christies.

Figure 45 — ADVANCED STEM TURNS. Track of turns; skier is ready to lift and close ski.







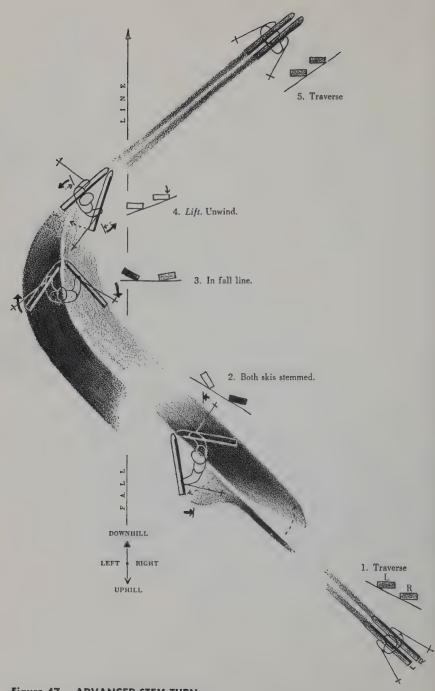


Figure 47 — ADVANCED STEM TURN.

DO'S AND DON'TS

Do be sure to stem with the heels of the skis, and not with the entire

Do let the weight come onto the stemmed lower ski before attempting to stem the upper.

Do time the closing of your skis to start when the outside ski comes into the direction of the new traverse.

Do use lift to facilitate the sliding in of the inside ski at the end of the turn.

Do remember to bring the inside ski ahead as the skis close.

Don't, in stemming, let the tops of the skis open.

Don't turn before both skis are in proper stemmed position.

Don't let your skis close too soon; you will stop turning and your new traverse will be too steep.

Don't lift the inside ski from the snow while closing the skis — it must slide parallel to the outside ski.

CHAPTER VI

Security Exercises and Controlled Sideslipping

The security exercises may be omitted from the skiing program by skiers who feel completely at home on their skis and fully conversant with all the maneuvers explained in preceding chapters. If you have any doubts about yourself, however, they will probably help you gain the confidence and courage required for learning the christianias.

LIFTING

Choose a fairly well packed and even slope which is as steep as you can schuss in comfort. Your object is to schuss the full length of the slope while rising and crouching, up and down, on your skis in a continuous, smooth and cadenced manner. From your correct schuss posture (weight on balls of feet, heels down on skis, knees limber, body at right angles to the slope, hips pulled in and skis and shins making an acute angle), rise slowly to an almost completely erect stance by straightening up without shifting the weight back or forward. As soon as you are nearly erect (body is not straight; there is still enough bend at ankles, knees, and hips to preserve the loose-jointed springiness which is essential to balance), crouch down slowly, a little farther than normal schuss position requires, and then rise again to full lift position. Continue this up-down-up-down exercise for the length of the practice slope. Keep in mind that in both rise and crouch your weight must remain centered on your skis, your center of gravity maintained exactly between forward and backward leaning, and don't let the heels leave the skis (Figure 48). Lifting the shoulders alone is not lifting, it is shrugging.

CHANGING LEAD

Here is another good security exercise. Schuss down your slope and while doing so lead with first one ski, then the other. Suppose you start down the hill with your left ski a little in the lead of your right. Once you get going, shift your weight onto your left ski (not by swaying the upper body to the left side, nor by shifting the hips) and then slide the right ski about three inches ahead of it. Now shift your weight to the right ski, and slide the left up ahead of it. Keep alternating leads this way for the length of the slope. In changing from one lead to another, don't try to pull the lead ski back. This will stiffen the knees. Leave it where it is, and slide the other ahead of it (Figure 49).

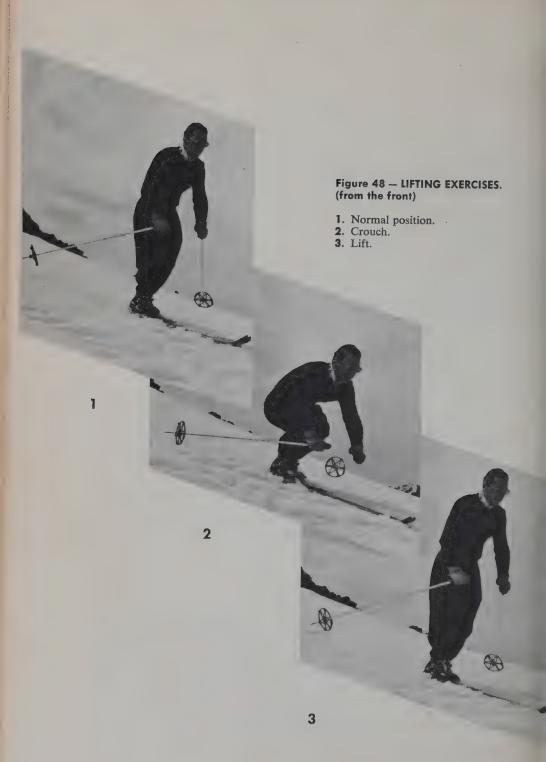
CONTROLLED SIDESLIPPING

The main characteristics of the faster christies are that the skis are parallel (not stemmed) and that they skid in turning. This skidding is an intentional, controlled matter. When forward motion, rotation and skid are combined, you get a nicely carved turn. And the skid part of the turn alone is the sideways slipping we avoided in the traverse by edging our skis on their uphill edges.

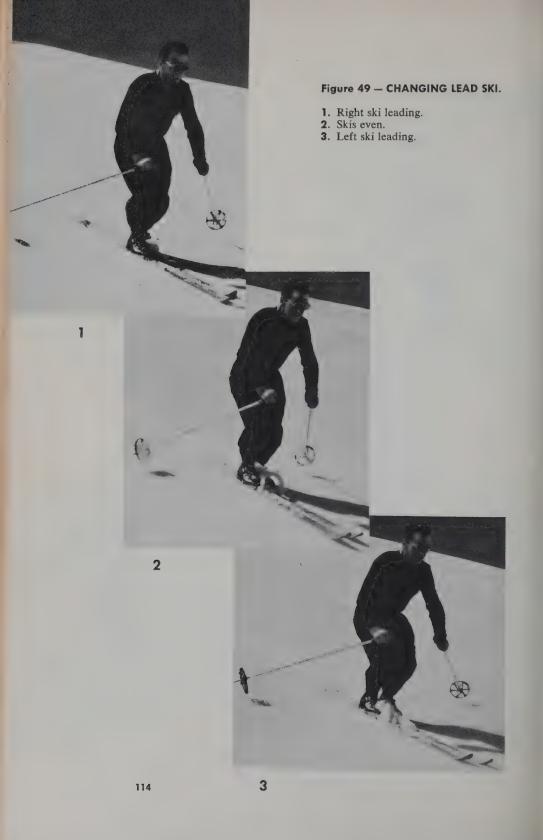
In order to learn how the skid works, and how it can be controlled, security exercises called "controlled sideslipping" are very helpful. They are *not* easy, so be kind and patient with yourself.

TRAVERSING SLIP

Start downhill in a traverse, and gradually release (unedge) the skis somewhat. You will continue in the direction of the traverse, but you will also lose altitude by sideslipping. You can alter the amount of slip by increasing or decreasing edging. Increase edging enough, and you will traverse again. You should have such good edge control that you can maintain a uniform rate of slip as you traverse the slope. Don't curve the spine by swaying sideways from the hips, and don't lean into the hill or out from it with the upper body. Keep weight equal on both







skis; don't let them slide apart or get out of parallel position (Figures 50 and 51). Descend the slope with alternate slips and traverses until you can do so with ease, slipping and traversing where you want to, calling your shots.

SIDESLIPPING TO STOP

Here is a doubly useful exercise. Not only does it help make you master of your skis for the better learning of the christies, but it provides you with the means of stopping in a fairly fast traverse, for which the snowplow is entirely unsuitable. It makes use of sideslip, counterrotation, rotation, and lift. The skis are kept parallel throughout the maneuver, and the object is to turn rapidly from a traverse to a stand-still in a position where the skis are squarely across the slope, not pointing downhill, nor uphill.

Start on your traverse at fair speed. When you are going along nicely, simultaneously crouch and counter-rotate the shoulders and upper body away from the slope. Don't pause; simultaneously lift with good elevation and rotate toward the slope with rapidity and force. Keep the skis parallel. You will make a sharp, abrupt turn toward the slope. As you come around, sink down fairly deeply from the lift, on flexed and limber knees, edge gradually more to stop sideslipping, meanwhile bringing shoulders back square over the skis.

To make these rapid, "tight" stop turns effectively, you must have good and fast elevation in the lift, enough virtually to unweight both skis. Good elevation does not mean rising upright; it does not mean jerking up, or jumping. It does mean exact timing and fluent, synchronized action of the entire body.

With a little courage and practice, you can make this stop turn from steeper traverses, learning to gauge the edging and the skid and the amount of rotation required to bring you around so that you are directly across the slope and stopped (Figures 52 and 53).

If you have too much vorlage as you turn, the turn won't come around; if you have rücklage, the tails of the skis will sail on down the slope, taking you with them, backward, en route to the inevitable dunking. As in every maneuver described in this book, the weight must be kept centered on the skis, so that the skier can instantly adjust to unevenness in snow or terrain by moving his weight in either direction.



Figure 50 — SIDESLIP FROM TRA-VERSE. 1. Sideslip from the front. 2. Sideslip from the back. 3. Sideslip.





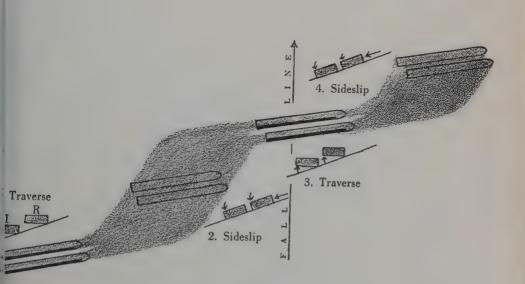


Figure 51 — SIDESLIP FROM TRAVERSE.

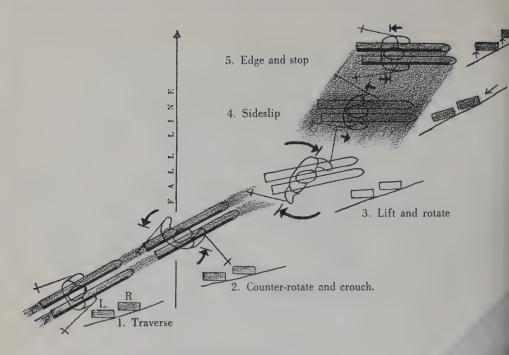


Figure 52 — STOP CHRISTIANIA FROM TRAVERSE.



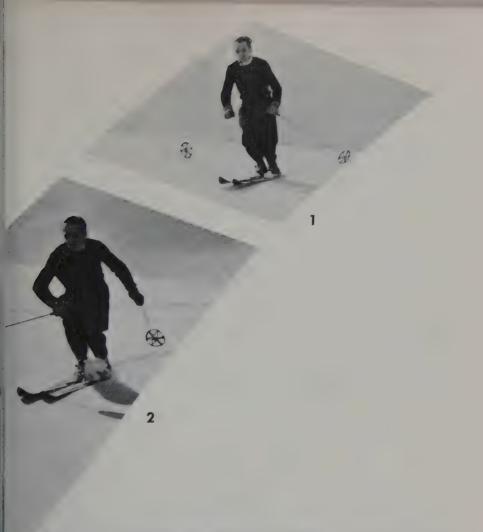
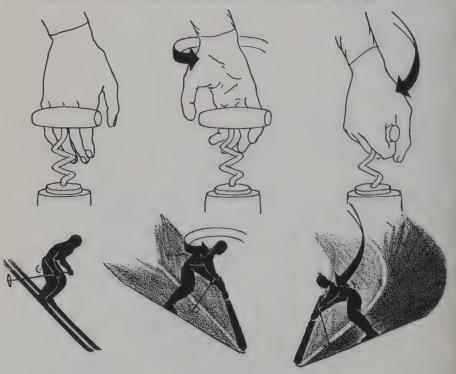


Figure 53 – STOP CHRISTIANIA FROM TRAVERSE. 1. Traverse. 2. Counter-rotation. 3. Lift and rotation. 4. Turn to stop. (Note bent knees and edging.)

The skier, having come thus far, may well be ready for the adventure of the christiania turns. He is ready, provided what has gone before — the snowplow, the snowplow turns, the stem turns, and controlled side-slipping — are all thoroughly mastered and understood. Just to make sure, let's refresh our minds by going back a little and in doing so bring out some hints and ideas which may help us to get stubborn problems cleared up.

Let's think, for a moment, of a corkscrew. Suppose its point is inserted into a cork and we wish to twist it down and all the way in. Since the corkscrew's motion is clockwise, like that of a screw, we move our hand *counterclockwise* before grasping the handle to give it the clockwise twist. We make this counterclockwise motion so that we will have the full turning radius of the wrist to expend in the clockwise motion. We then can drive the corkscrew around and down (Figure 54).

Figure 54 — THE "CORKSCREW" ANALOGY. Hand approaches straight (traverse), then turns counterclockwise in order to get maximum wind-up (counterrotation), then turns corkscrew around and down (rotation and turn).





Teetotalers may use the analogy of a screw being driven into a block of wood.

The analogy with a ski turn is, by now, clear. The counterclockwise motion is the countermotion, the screw-sise motion around and down is the body-and-anougher rotation combined with the sinking down of the body into a crouch.

Unfortunately, the analogy of the conkscrew is not complete; it takes more than lift, crouch, and rotation to make skis turn smoothly, fully, and well. This is because the conkscrew is curved, whereas skis are straight. To make skis carve a curve at speed, the skier must skid them around the turn. And to achieve this skid, we must recall the controlled sideslips and employ their principles.

DO'S AND DON'TS

Do try to keep the akis parallel and close together during the sidealip.

Do keep your shoulders square during the sideslip.

Do keep your weight above your skis, not leaning toward the slope.

Do use lift and rotation to stop your traverse by turning toward the slope.

Do edge both skin equally toward the hill in the turn from a traverse.

Don't release edges of the skin completely in sideslipping. If you do, the downnil edges may catch on the snow and spill you.

Don't let the akin open at the tips or cross at the tails while you sideslip.

Don't attempt the straight sideslip in deep or soft snow — it is for packed slopes.

Don't attempt the turn toward the hill from a traverse by twitching your hips or wagging your backside.

Dom't jump around, the tikes must stay on the snow throughout the turn toward the slope.

CHAPTER VII

The Stem Christiania

If you have been combining diligence in learning with the fun of skiing, and have mastered the maneuvers so far explained, you are more than ready for the first of the christies, the stem christie.

The stem christie differs from the stem turn in three major respects: (1) The uphill ski does not stem at all; (2) you must have good speed before going into the turn — at least fifteen miles per hour, if you know how to judge speed; and (3) the skis close parallel much sooner in the stem christie than in the stem turns. Less important differences are: the stemming of the downhill ski is less pronounced than in the stem turn; lift must be good enough to relieve both skis of weight sufficiently so that they can go into the turn readily; the radius of the turn is longer than that of the stem turn; the degree of counterstemming with the downhill ski and the length of time it lasts are sufficiently diminished so that speed is not checked; the body leans toward the inside of the turn — actually toward the imaginary center of it — and lift plus rotation accomplish most of the work of turning.

All this sounds complicated, and like much too much to bear in mind at once — and it is. Try to understand it, and to grasp the mechanics of the turn as they are explained and analyzed, but don't try to remember all the details. If you do, your mind will be so intent on remembering, and so cluttered with fine points of technique, that, likely as not, you'll find yourself having unwittingly executed the "tree christie," an imaginary maneuver of very tangible effectiveness, in which you wrap yourself and skis around the nearest tree. While this is indubitably an effective means for stopping, it is not considered good form by ski stylists.

So, don't try to remember everything but do try to understand. Then go out on the slope, and after your half-hour warmup in the snowplow turns (yes, that half-hour warmup is a very good thing for everyone, novice and expert) start doing advanced stem turns. Do them on a fairly steep slope, making curves near the fall line rather than wide turns, with good speed, plenty of shoulder action, good edge control — and you'll find them becoming very nearly stem christies. It takes a sharp eye indeed to tell the difference between a well-executed, fairly fast advanced stem turn and a comparatively slow stem christie. The fact that the uphill ski is not stemmed is the distinguishing mark.

The following analysis of the stem christie, step by step, should be read with constant reference to the photographs and diagrams in Figures 55 and 56.

STEM CHRISTIE ANALYZED

TRAVERSE: You are coming down the hill at good speed, in a rather steep traverse. (Let us assume you are moving from the upper right-hand side of the hill toward the lower left. Downhill is to your right, and you are going to make a right turn across the fall line.) Your left (uphill) ski is very slightly ahead of your right (downhill) ski. Both skis are on their uphill edges.

Countermotion: Counter-rotation of shoulders and upper body are executed simultaneously with stemming of the right (downhill) ski, and the crouch preparatory to lift.

START OF TURN: The counter-rotated position is not held. Immediately you are "set" for the turn, lift, rotation, weight shift, and edging (on its inside edge) of the left (uphill) ski are initiated. These movements must be executed with sufficient force to start the uphill ski turning.

TURNING: Once the turn has commenced and the weight is on the left ski, the skier draws the right (stemmed) ski parallel with the left ski and, while doing so, changes its edge. As the turn progresses, the skis are parallel, both on their right edges, the skier's body is leaning toward the center of the turn, he is sinking down into the crouch which follows his lift, the right ski has moved a little ahead of the left ski, rotation is continuing smoothly, and hands and arms are moving freely and fully with the shoulders.

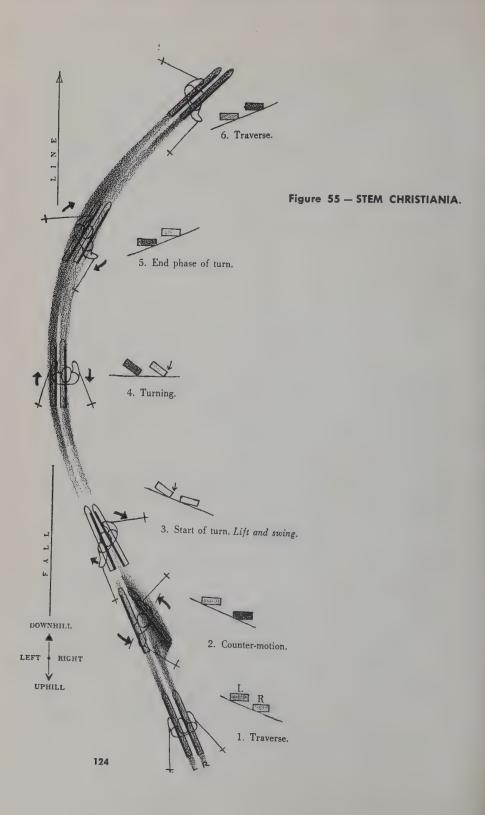






Figure 56A — The phase of the turn corresponds to No. 2 of Figure 55. In attempting full counter-rotation, the skier has assumed the typical beginner's "boxing position" of the downhill arm. His stance is too erect, and his weight is on the uphill ski; in consequence, he will be unable to lift and swing into the turn.

END PHASE OF TURN: Just before the skier comes directly into the line of the new traverse, he is crouched, he has fully rotated his shoulders, he is skidding somewhat downhill (but if his edging is correct he will not skid much — remember controlled sideslipping?), and his body is leaning in toward the hill enough to counteract centrifugal pull, and enough to prevent edging the skis by bending the ankles, which would be a terrific strain on them. Again, let us stress that a line drawn through the body from head to feet is, if the turn is being done correctly, at right angles to the skis (looking at the skier from front or back). Similarly, looking at the turn from the side, a line drawn through the skier's center of gravity is at right angles to the skis.

TRAVERSE: As the skier comes into the traverse, he can either straighten body and shoulders, continuing in the traverse, or he can use his crouched, rotated position to start a new stem christie in the opposite direction, thereby linking the second turn to the first.

The above is a description of *one* stem christie. No two are exactly alike. The crucial timing of rotation, weight shift, lift, edging, etc., depend on the speed, the obliqueness of the traverse, the condition of the snow. In general, it can be said that the greater the speed, the

sooner the synchronized movements of the turn begin. The start of the closing of the skis together is also a matter of speed. At good speeds, this closing is started with the lift and weight shift, so that the skis are parallel throughout most of the turn.

WHAT IS SWING?

We now introduce a new word, swing. The christies are classed as swing turns, although the stem christie is a sort of mongrel, being started with vestiges of the slower speed turns, and then developing into a swing turn. Swing turns are those turns in which the position of the skis is virtually or entirely parallel throughout the turn, the turning being the result of speed plus shoulder, body, and knee action. The measured down-up-down of the lift and crouch, and the forceful use of rotation and knee action, arm and hand motion, body lean — all these come under the heading of swing.

You may ask in what way counterswing and swing differ from countermotion and rotation, as employed in the slower turns. In analysis, in a series of high-speed-camera "stopped" pictures, there would be no apparent difference. In actual execution, however, there is a great difference. You will recall that in the advanced snowplow turn we stemmed both skis, held the plow position for a while, made our counter-rotation, then went into the turn. In the stem turn, we stemmed the downhill ski and counter-rotated, then stemmed the uphill ski, then went into the turn. In a swing turn, the countermotion is not separated in time for the actual start of the turn. It is a springboard for the turn, not a distinct element which is a "held" position. In the stem christie, the counterswing is a windup; the stemming of the downhill ski is also a "pushing off" onto the uphill ski; the countermotion of shoulders is compressed in time, so that it is like a quick, short drawing back of the fist before a punch; and it is instantly followed by the punch itself, i.e., the swing.

The stem christie at good speed can be described then, as follows: traverse; counterstem and counterswing, flowing without break or pause into lift and swing; traverse again.

The foregoing words, or twice that number more expertly chosen, can't tell you as much about the stem christie as the pictures and diagrams can. Study both. The numbers on the pictures are keyed to the

same numbers on the diagrams. The captions to the pictures explain salient points and describe what is happening. In the photographs, watch especially the position of knees, skis, edging and shoulders. If any point seems unclear to you, reread the text, but the pictures tell the story best.

If you can do the stem christie when and as you want to, you are a skier. You may not be an expert, or a racer, or a ski acrobat, but you are out of the amateur ranks and a person to be looked upon with respect and admiration on any slope in the land.

LINKING STEM CHRISTIES

Now we are ready for a thrill: swinging downhill, in a series of linked stem christies, at good speed.

Linked stem christies are universally useful for descending a hill under control and for making you feel the master or mistress of the skier's world. Swinging down a hill in a series of long-radius christies is called *schwingen* in German (or, rather, Austrian, since skiing terms originated in that country) and it is skiing de luxe in any language.

In the long-radius christies you use for linking, the counterswing for each link is made up mostly of body windup and crouch (follow-through) from the previous turn, with very little stemming of the ski on the inside of the turn to come.

The individual christies which make up the links are not completed; that is, you start the next turn before the preceding one has brought you all the way around. There is no traverse between turns, either.

The action of shoulders, knees, and body is rhythmical and continuous; the "down" which is the end-phase crouch of one turn is also the "down" which is the starting phase of the next turn.

Just as one crouch serves as end phase of one turn and start of another, simultaneously, so the final twist of body-and-shoulder rotation at the end of one turn serves as the counterswing for the following turn.

Here are the actual steps in linking stem christianias:

You are in a traverse. Simultaneously counterswing and counterstem. Immediately lift, weight-shift, and swing, all together. Follow through, so that as the turn comes around toward a new traverse, you are crouched and your rotation is at its full. Don't pause — you are wound up, "set," for the next turn in the opposite direction. Stem that

downhill ski a little. Just enough so that you can use it as a spring-board. Immediately push off from it, into a new turn. Keep it up, turn after turn, in cadenced rhythm, right down the hill (Figures 57, 57A and 58).

Figure 57 — LINKED STEM CHRISTIANIAS.





Figure 57A — TRACKS OF LINKED STEM CHRISTIANIAS.

Once again, it is the pictures, diagrams, and captions which will most reward careful study. Follow the sequences while going through a dry run; that is, stand up and go through the movements in so far as it is possible while you scan the progressive stages of both pictures and diagrams. Note especially how and when the skis close, at what point the inside ski of a turn overtakes and leads the outside ski, how much and when the inside ski goes over onto its outside edge, and the

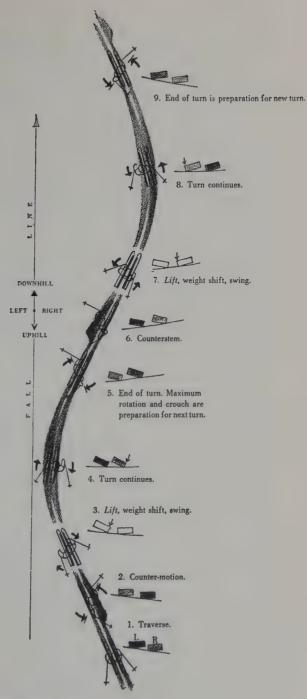


Figure 58 — LINKED STEM CHRISTIANIAS.

depth of bend and position of the knees. Note the angle of the body, which leans in toward the center of the turn.*

THE POLE CHRISTIE

Although frowned on by some ski theorists and teachers, the stem christie executed with the help of one pole is an extremely useful maneuver in the repertory of the all-round skier. At this stage of development in your skiing, its use is restricted to adverse skiing conditions. (When you get to advanced technique, you'll employ it frequently.) Bumpy, rutted, frozen, and uneven snow, terrain strewn with rocks or stumps, etc., demand of the skier more than ordinary agility and security on skis. At such times the pole christie is invaluable. (The principal objection to it is based on a feeling that the skier who once learns it will overuse it — which is sometimes the case when the pole christie is taught before a sound stem christie without pole is learned. Another frequent objection is that any placing of a pole in front of the skier is potentially dangerous, since a slip or misjudgment

Once more, we reiterate our conviction that skiing on the whole of both skis, with the body weight poised between vorlage and rücklage, i.e., vertical to the skis and ready to adjust either forward or back, is the only safe and sure way to ski on every kind of snow, and under any circumstances. This vertical posture preserves speed, rhythm and cadence. It helps the skier to carve clean turns, in which the skid is distributed over the curve instead of coming abruptly at the end. Most important, it is the position of greatest stability and latitude for adjusting to sudden changes.

^{*} It sometimes happens that a christie, through faulty action in the early phases of the turn, does not "come around" as far as the skier desires. Usually, this is caused by improper timing, so that swing is used up before the turn is complete. There are two ways to rescue such a turn, neither desirable, to our way of thinking. One way is to employ rücklage: the weighting of the tails of the skis by leaning back makes them skid downhill. This will complete the turn (in the sense of getting the skis pointed in the desired direction) but it makes an abrupt and unattractive end phase and leaves the skier in the unstable, rücklage position when he most needs stability. The forced skidding of the tails of the skis also retards speed and breaks rhythm. The other expedient (and one which is in vogue) is to employ extreme vorlage. The skier almost dives forward, hanging by the heels from his cables and leaning 'way out over the tips of his skis. The weighted tips act as an anchoring pivot point, and the unweighted rear parts of the skis slide freely over the snow, skidding in an arc of which the tips are the center. Here, again, the posture is potentially unstable; worse, if the snow is deep and soft, or if there is a thin crust, the ski tips, heavily weighted, may dive below the surface, throwing the skier forward and stopping him dead.

exposes the skier to the risk of ramming himself with the pole handle. If the wrist sling is properly worn, this danger is eliminated.)

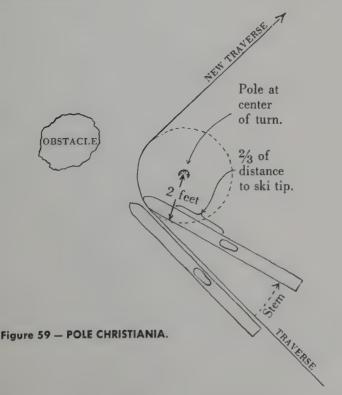
In the pole christie, one pole is planted in the snow, ahead of the skier and toward the inside of the turn, and is used as a pivot point for the turn. This provides the skier with a security tripod consisting of two skis and one pole.

This is how the turn is performed. The skier is in a traverse and decides to turn. He counterswings and counterstems, and just as the counterswing is completed (that is, just before he lifts and swings) he plants the pole on the inside of the turn about two feet out to the side and about two thirds of the way from binding to ski tip. The instant the pole point enters the snow, he starts his turn, using the pole as a center

The pole is used for stability and as a steadying agent.

Practice pole christies, linked, all the way down a slope. As the swing of one turn comes to completion, the arm and hand on the outside of the turn are forward. That is the instant to plant that pole, so that the linked turn pivots around it.

Figure 59 shows the correct placing of the pole and 60 shows linked pole christies.



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Figure 60 — POLE CHRISTIANIA. 1. Close-up — placing of pole. 2. Track of linked pole christianias.





Figure 60A — WRONG START OF POLE CHRISTIANIA. The skier's position is not only wrong, it is dangerous. Pole is too close to ski tip, skier is bent over it, and pole handle points at his body. In this position, if he were going fast, he could injure himself badly.

DO'S AND DON'TS

Do launch your turn as soon as the lower ski is stemmed.

Do enter your turn with good speed and keep your stem narrow.

Do let the arms and hands move around freely with the shoulders and use good knee action throughout the turn.

Do place your pole far enough to the inside of the turn (at least two feet) in executing the pole christiania.

Don't stem out with your uphill ski.

Don't try to make a slow-speed christie - please!

Don't shove the inside ski too far ahead when the skis close.

Don't get into the pole-christie habit; this turn is meant only for rough snow and bumpy terrain.

CHAPTER VIII

The Pure or Stop Christie

As a reward for your skiing efforts so far, we'll let you in on a secret about yourself. You have already executed a christie without knowing it. A parallel christie, at that — or anyway, a part of one.

Back a while, you were making a sliding stop from a traverse, as described under the section titled "Controlled Sideslipping." If you recall, you turned toward the slope from a traverse, with the skis parallel, by using good lift and rotation. That maneuver was the infant pure christie, not yet grown up enough to be used from a schuss. Now we're ready to perfect the real thing.

The pure, or stop, christie is a stopping turn. It is an abrupt and rather spectacular swinging of the skis at right angles to the line of motion, followed immediately by a deep edging of both skis which brings you to a fast, skidding stop, usually accompanied by a flattering spume of snow and the ohs and ahs of the beginners. It is the only means of stopping quickly from a fast schuss.

The stop christie (a more descriptive and hence a better name than pure christie) takes courage to try, but it isn't hard to do and we'll work up to it gradually. The patience to practice it will be well rewarded, too, since between them the snowplow and the stop christies will remove the major mental hazard of the sport: fear of being unable to stop.

Let us begin with our stop from a traverse. Start again, as you did in controlled sideslipping, with a not too steep traverse and turn toward the slope, using good lift, plenty of counterswing, and lots of knee action as you come around.

Now try the same thing from a steeper, faster traverse. You'll have to express every motion with vigor, since you have farther to turn.

When you feel completely confident that you can stop from a quite steep traverse by turning toward the slope, you're ready to try the real stop christie. Let's start by coming down the hill in the fall line (schuss) and stopping when we come to the level runout.

Schuss down a practice slope, with good speed, and as you come out on the level counterswing your body to its fullest extent, then *lift*. At the instant when both skis (equally weighted and in schuss position) are almost pulled free of the snow, expend all your body swing with rapidity and force. The skis will turn across the slope. Keep them very nearly flat as the weight comes down on them again, and, as you come downward in your crouch, edge them gradually on their uphill edges to stop your lateral skid.

The stop christie is quite a strain on the legs, and you must measure your capacity by edging quite slowly at first, and then speeding up the edging until you know what you can take. The more abrupt the turn, the more you will have to lean in toward its center to overcome centrifugal force, and the more of a strain the edging will be (Figures 61 and 62).

Practice stop christies on the level runout before you attempt them in the middle of a hill. And then learn to do them on a hill, in the middle of the slope, near the top, near the bottom, wherever you want to (Figure 63). Now you have full control indeed. You can call yourself a skier — and no mistake.



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Figure 61 — STOP CHRISTIANIA ON THE LEVEL.

- Schuss and counter-rotation.
 Swing.
 Stop.



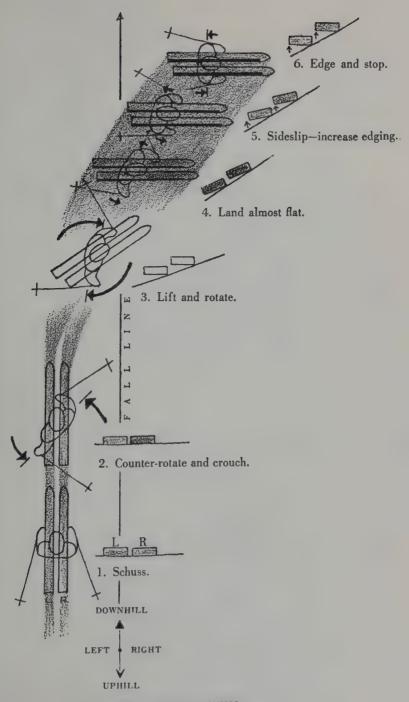


Figure 62 — STOP CHRISTIANIA FROM SCHUSS.

Figure 63 — STOP CHRISTIANIA ON A HILL.

- 1. Schuss position.
- 2. Counter-rotation.
- 3. Beginning of turn. (Note banking.)
- 4. End position.



1

DO'S AND DON'TS

Do look back to make sure no one is schussing down behind you before you make your stop.

Do keep your weight centered. Weight to the back will make the tails of the skis cross; weight too far forward will make the skis dive in deep snow and will make the tails skid too far around on packed snow.

Don't turn the skis with the feet. Use lift and rotation.

Don't try to make too tight a turn from high speed.

Don't press knees in toward the slope at the end of the turn; lean in with the entire body.

Do edge and weight skis equally at the end of the turn.



Parallel Christiania and Tempo Turn

Up to this point — and we've come a long way — everything learned and everything explained has been a matter of technique and skill. The parallel christie and the tempo turn (experts will argue for hours whether there's any real difference) are matters of art and courage. You can ski well and happily all your life without ever executing one of these turns; their accomplishment will, however, give you a foretaste of heaven on earth, or, rather, heaven on skis, which the true enthusiast will tell you is still better.

Before going on to the turn or turns, let us try to solve the controversy about whether or not parallel christie and tempo turn are one and the same. To our minds, the term parallel christie applies to a "family" of turns, all those turns in which the skis are parallel throughout the turn. The purpose of the long-radius parallel turns is either to change direction or to maintain control — not to diminish speed. In a very limited sense speed is controlled; if a skier schussing a very steep slope feels he is gaining speed too fast, he can swing into a series of parallel turns to maintain a uniform speed with no acceleration. But the parallel turns are not used primarily for decreasing speed.

This family of turns must be performed on all the varied gradients, in all the varied snow conditions, with all the radii which the skier selects or encounters.

We say that the tempo turn is that one among the members of the parallel family which has the longest radius and is performed close to the fall line at high speed. We say that every tempo turn is a parallel christie, but not every parallel christie is a tempo turn.

The parallel turns of long radius are the easiest to perform in the sense that they require least physical effort and involve fewest body motions. On the other hand, they are the hardest to learn, because they

cannot be done by rote, or step by step, but are a matter of "sensation." You have to have the feel of snow and skis and weight distribution; the turn, or curve, rather, is fluid and meltingly flowing; the movements involved are the same as those in the stem christie but most of them are reduced to muscular impulses rather than distinct movements, while some of them, like the counterstemming in the counterswing, are so reduced, and done so rapidly, that they show up only in slow-motion pictures of the turns. On the other hand, as counterswing and swing become less pronounced, lift takes on added importance.

It would be foolish at this time to launch a long and detailed analysis of the parallel christie and tempo turn. If the reader does not by now know his skis well, and know how they respond to his body movements, no amount of reading will help. But for the man or woman who is confident and at home on skis, and who can do stem christies and stop christies easily and well, the following suggestions and explanations will prove helpful.

The turn is entered fast, usually from a traverse which is very near the fall line. Weight, of course, is equal on both skis, the axis of the skier's body being vertical with respect to the slope. There is diminished counterswing, and usually there is also an instantaneous and almost microscopic counterstemming of the inside ski of the turn as the skier gets set, although this is instinctive rather than intentional. Immediately, the skier lifts and starts rotation and edging of the skis. (Actually, the lean of the body against centrifugal pull in the turn brings the skis up on their edges. It is as if the skier were a low-wing monoplane, his body the plane's body, his skis the plane's wings. As the plane banks a turn, the body of the plane tilts, but it does not bend, and the relationship of plane to wings stays the same — a right angle. So with the skier and his skis; he leans in toward the center of



The body leans toward
the center of the turn
as if it were lying
against the side of an
imaginary cone.

skis bank the turn the wings of a re.

the turn just enough to keep from skidding off sideways, and his skis stay in the same relation to his body as they are when he is standing still on the level.)

As the skier lifts, at the inception of the turn, his weight comes a little onto the outside ski, but the inside ski is not unweighted as much as in slower turns.

Some skiers describe their action at the start of a parallel turn in terms of very slight shifting of weight first from both skis to the inside ski of the turn, during the moment they are getting set, then from the inside ski to the outside ski. But even this weight shift is slight, and while the outside ski carries the larger part of the weight, the inside ski is by no means unweighted.

Similarly, the lift and crouch are neither so abrupt nor so obvious as in the stem christie, but they are extremely important, for it is the exact instant when the up changes to down (that is, the instant between the end of the up and the start of the down) that the skis are momentarily unweighted. The return of the weight to the skis must be protracted and attenuated by the crouching down again after the extension of the body in the lift. You've seen a baseball player soften the impact of a ball on his mitt by letting his hands come back toward his body as the ball is caught. You have seen a jumper use his bended knees to take up the shock of landing. Just so you must use your crouch to spread out the return of full weight to the skis over the entire length of the curve.

Edging in the parallel turns is an extremely delicate matter. On smoothly packed snow it is not crucial if a turn is spoiled by too much skid, or too abrupt ending, due to too little or too much edging. But in deep snow or soft snow, an error in edging can cause a spill at high speed. Edging in the parallel christie does not start the turn, though both skis are often fairly sharply edged at the completion. Here, again, the speed, the snow, the radius, are determining factors.

The following is an analysis of one parallel christie, to the left.

TRAVERSE: Skier is in an oblique traverse, close to the fall line, at good speed, moving from upper left of hill to lower right. Weight virtually equal on both skis, right ski very slightly in the lead, skis close together and parallel.

GET SET: Counterswing and crouch, both diminished, and of very short duration. Weight is solid, right shoulder is somewhat drawn back, knees flexed and easy.

Swing: Immediately he is set, the skier starts lift and swing. Skis start to turn and weight comes over partially on the right ski. Body starts leaning in toward center of the turn, both skis are edged a little and equally. Knees are parallel, equally bent. Weight is centered—neither forward nor back. Left ski begins to move a very little ahead of right ski.

Crossing Fall Line: As the fall line is approached and crossed, the knees are flexing down, the swing is half expended, the edging of the skis, which remains equal, becomes a little more pronounced. Although the right ski remains somewhat more weighted than the left throughout the turn, the skier should attempt to ski on both skis as much as possible.

END OF TURN: Here the skier must preserve the smooth carving of the turn, neither skiing on the tips while he hangs from the cables, nor leaning back to weight the tails of the skis. Rotation and knee bend are nearing their fullest expression. In another moment the skier will be ready to launch his next turn in the opposite direction, since completion of the turn leaves him "set" to start his parallel swing to the right.

That is a parallel christie analyzed, but you can't be expected to read as you ride your boards down a steep slope at speed, asking them to pause while you turn the page to find out what to do next. The analysis is designed to give you an understanding of what happens in the turn, and to provide a reference for the clearing up of difficulties encountered on the slope and confusions encountered in your mind as to just what happens when. One ingredient which is essential to high-speed parallel turns is courage. As a matter of fact, with courage and the confidence to maintain speed, the parallel christie is the easiest turn to execute on bad snow.

Here again you are urged to scan the pictures and diagrams of parallel christies (Figures 64 through 67) and the diagram of the dynamics of the swing turn (Figure 68), rather than depend on the text.

The aim of technique and form in every sport is the reduction of effort to a minimum, or, to put it positively, the maximum effectiveness of effort. These parallel turns, the ultimate in skiing, are also the ultimate in efficiency. And that efficiency can be learned only by practice. But an improper conception of the turn, a wrong notion of how it is done, can lead to your practicing it incorrectly, and you can learn bad habits as surely as you can good ones, if you persevere.



Figure 64 — LINKED PARALLEL CHRISTIANIAS.

- 1. Traverse.
- 2. Counterswing.

- Counterswing.
 Swing.
 Ending of first turn.
 Ready to lift and swing.
 Swing in second turn.

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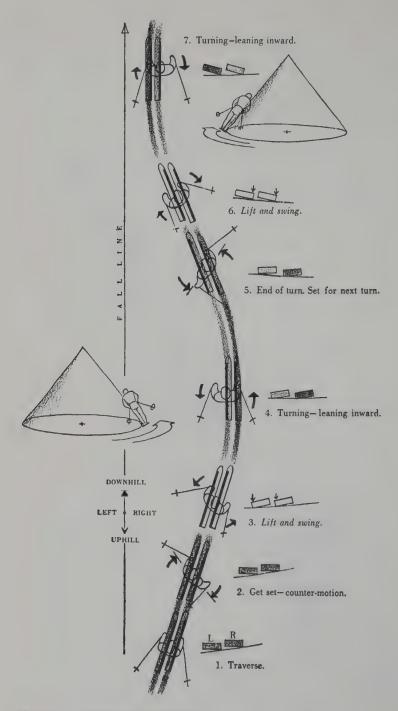


Figure 67 - PARALLEL CHRISTIANIA.

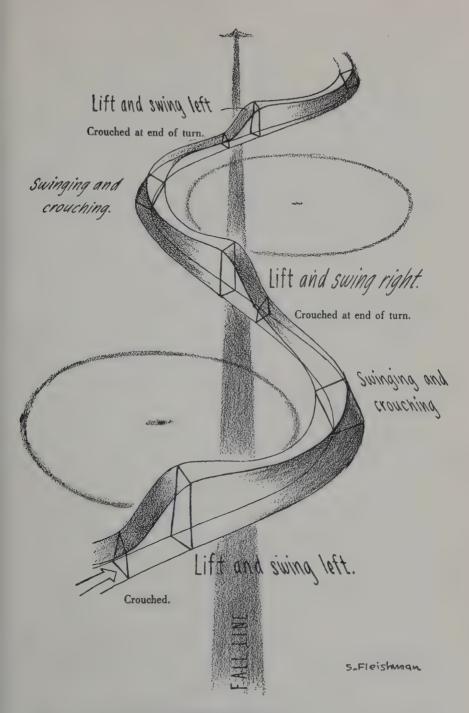


Figure 68 — DYNAMICS OF THE SWING TURN.

So study the text and the pictures and diagrams with reference to your own performance. Imitate consciously the attitudes of body, hands, poles, shoulders, ankles, and knees. You won't imitate them exactly no matter how hard you try. Each expert has his own unique style. But imitation is the easiest means of learning, and that's what you are after.

We hope you achieve it. If you do, you will know the sensations of the free-soaring bird, as you come swinging down a steep slope at high speed in linked parallel turns, sure of yourself, capable, controlled, alone with your skis and your skill and your strength pitted against a world of dazzling white, yet at the same time in tune with it.

Advanced Technique

By now, presumably, the reader has mastered the basic maneuvers of open-slope skiing and has attained a good feeling for the sport in general. He is ready to consider those more advanced and specialized aspects of it which come under the general heading of advanced technique. These include the short swing and the much misunderstood wedeln. Before discussing and describing these adjuncts to good skiing, some observations are in order.

Unless you've been skiing alone in the wilderness, or on the mountains of the moon, you will have been exposed to at least one school of skiing which insists that it is the new religion of the slopes, that no other system of teaching skiing promises such wonders in such a short time, and that all previous methods of skiing and of instruction are obsolete. We applaud this enthusiasm for the new because anything which creates controversy, which suggests new ideas and new approaches, which gets people into excited discussions of skiing is, in general, good for the sport. We also know that, historically, these extreme attitudes and outlandish techniques gradually simmer down or vanish, depending on how much that is useful can be distilled from them. The whole progress of skiing can be seen as experimentation, extreme departures, and then the gradual gleaning of a few grains of good skiing sense to add to the whole of skiing lore and the art of the sport.

So, though we have no quarrel with any of the multitudinous schools of teaching and of skiing, we would like to warn you here that much that is being offered as new is the rediscovery of techniques which have already been discarded as not only not new but not suitable. We would like to warn you that in skiing, as in any other sport, the extreme and the bizarre may look interesting, but they have no place in teaching or

in the development of controlled skiing with technique suitable to all ski conditions. Finally, we would like to re-emphasize our belief that a system of teaching — whether that expounded in this book or any other — can be good and correct only if everything learned from the very first day is used, if everything learned progresses normally and logically from what went immediately before to what immediately follows, and if the ultimate aim is mastery.

It is interesting to note in the development of various schools and styles of skiing that, however different they may be, they have certain things in common. Usually they originate with one man who himself is a great skier but who also happens to be something of an individualist. Frequently this is connected with his physique; a man who is short in stature, extremely strong in the legs, and rather heavy may become a championship skier by developing a style of his own designed to take advantage of his particular physical configuration and to overcome whatever drawbacks it may present. Should such a man be a consistent race winner, it is a very good bet that by the next season there will be thousands of eager-beaver skiers striving to imitate him, however unsuitable his technique may be for them. By the same token, it is quite possible that this individualistic skier will become an honest and dedicated believer in his system for everybody.

Those who have any memory in the art at all will recall the heyday of Dick Durrance, the great skier and inventor of the so-called dipsy-doodle — which thousands of skiers tried to emulate and very few achieved. Those with a memory will recall the excitement with which the extreme ruade (ruade — literally, "cow-kick," that is, a sharp kicking up of the heels accompanied by a forward diving of the body) as employed by Emile Allais swept skiing by storm. They will remember the days when the word on everybody's tongue was "parallel" — "Learn parallel from the start," "Ski parallel!" There was a period when the word "vorlage" was interpreted so radically that thousands of skiers hung over the tips of their skis by their heel cables even when going down a very gentle slope. Turning under these circumstances was incredibly difficult; a snowplow with no weight on the heels didn't plow. But vorlage was the word, and that's the way everybody tried to ski, despite the ensuing proliferation of "nose christies."

By now it should be clear that skiing, like every other sport, and every other human activity for that matter, entails fads and fancies as well as solid procedures. Far be it from us to say that the technique of the sport has never changed and will never change. That would be foolish. We are not prophets and we know that there have been changes, some of them dictated by changes in terrain, others by changes in what people want out of skiing, others by developments in equipment. Certainly the future will see further changes. All we say, and we repeat it over and over again in this book, is that we believe that by following the orderly procedure outlined in these pages and by attempting to ski in the manner described, the novice, the intermediate and the expert will be skiing with more pleasure, more precision, more style, more flair and more control than can be achieved by any other method of which we know.

SKIING OVER BUMPS

(All action photographs which follow in these pages were taken with a robot camera equipped with a six-inch lens to "freeze" the skier at each phase of the maneuvers being executed.)

The great traffic on today's most popular runs and slopes has created a condition rarely encountered years ago. This is the well-traveled slope which is studded with bumps or, as they are called, moguls. These are not to be confused with the long, natural ridges generally encountered on most virgin slopes. Moguls tend to be steeper, smaller and somewhat convex in shape — almost conical. They occur fairly close together and there are regular grooves and valleys between them. To the practiced skier they provide challenge, variety and fun. To the person who does not know how to cope with them, they present a forbidding problem. We shall now attempt to solve that problem for these people.

It is virtually impossible to ski bumpy or moguled terrain using the snowplow turn or the stem turn, as the grooves and valleys between moguls are so narrow as to make it impossible to let the skis assume the plow position. Since moguls develop on the steeper slopes, however, and are not likely to occur on nursery and lower-intermediate slopes, it is unlikely that the recreational skier will encounter them before he has fully mastered the stem christie. Accordingly, we will now discuss and explain how to negotiate moguls applying the stem christie. (In the event that a stem-turn skier does encounter a bumpy snow field, the best procedure for him to follow in negotiating it is via

long, shallow traverses with good traverse position and elasticity in the knees to absorb the oncoming bumps — see Figure 25. If it is necessary to turn before coming to a smoother part of the slope where the stem turn is possible, he should attempt to sideslip to a stop from the top of a bump and then make a kick turn to traverse in the opposite direction.)

STEM CHRISTIANIA OVER BUMPS

The major difference in the stem christiania as described earlier in this book, and that which is used in skiing over and among moguls, is the use of the poles and the shortness of the turn. If you will go back to the description of the pole christiania (page 132) you will see how the pole is used to make a tighter turn to avoid an obstacle. In employing the stem christie over bumps, the poles are held farther forward than in normal skiing position, the hands are higher, and in this way either pole may be quickly placed in the snow to initiate a turn. As usual, in descending a slope with christianias linked by traverses, the skier in the traverse position has good elasticity, looks ahead, and tries to estimate where his turn will be made. In skiing among moguls, the place you will pick is the top of one of these bumps, which will give you, in addition to your usual body lift, the lift provided by the shape of the bump. With this additional lift, and with the pole employed as in the pole christie, you will be able to execute a much sharper turn than the normal stem christiania and will be in the new traverse before entering the next groove. This is the full purpose of this maneuver, i.e., to make use of the lift provided by the bump and to complete the turn before the skis are in the hollow of the next groove. Obviously, this necessitates much faster action throughout the turn and hence much more accurate timing. (See Figures 69, 70, 71, 72.)

The procedure may be described as follows: In his traverse the skier skis as squarely on both skis as possible, uphill ski leading to "feel" the way, knees very elastic and responsive to variations in the slope, poles held somewhat forward in readiness for use, arms away from the body sufficiently to give balancing action, skier looking ahead to plan his turn. His knees may be likened to shock absorbers, his poles act like the stabilizers on a plane's wings. Should he gain too much speed,

he sideslips a little at the tops of moguls (the only part of the terrain where there is an opportunity to do this, since it is impossible in the grooves where speed rapidly accelerates) and so is ready when it comes to the turning place, with the correct speed and the correct stance to execute his turn. Suppose this is to be a right turn. Simultaneously make a short stem with the right ski and plant the right pole about as far forward as the point where the shovel (i.e., the curved and wider portion of the front of the ski) of the ski first makes contact with the snow and about a foot out to the side. (The distance from the skier and from the ski at which the pole is placed will obviously vary with the speed, the terrain and the size of the skier; the figure given here is average.) The instant the stem is made and the pole is placed, the skier swings and closes the skis vigorously, with good rotation, so that by the time he is in the next groove and picking up speed he is once more squarely over his skis and with them. By the time the skier is through the groove and at the top of the next mogul. he is already — thanks to his rotation — in a position for the left turn. Now the left pole is placed and the left ski stemmed, the skier swings and rotates and closes, and he's in the next groove. Thus, with correct pole placement, correct stemming, and correct rotation, the skier is constantly in control of his skis, above them, and always ready after each turn and short traverse for the next turn in the opposite direction.

It is important here to consider the critical nature of timing in this maneuver. Obviously, if the turn is executed too slowly it will not be completed in time to have the skis parallel going into the groove. And even if it is so completed, there is the possibility that the outside shoulder will not come around fast enough to put the skier squarely over his skis as the turn completes (see later discussion of delayed shoulder action, intentional and unintentional). This delay results in the skis running ahead of the body — as we already know, a very unstable state of affairs which leads to the "sitz christie." There is an equal and opposite failure in timing which is over-rotating. In his anxiety to be there on time and to be sufficiently expressive in his swing, the skier overdoes it, with the result that the ski tips run into the side wall of the bump immediately following the one on which the turn was initiated and catch there — dumping the skier. Both errors of timing — that is, the delayed shoulder and over-rotation — tend to place the skier's weight on the uphill ski, which is unstable and hence incorrect.

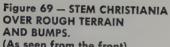
Bearing in mind the foregoing, let's ski a slope which is full of

bumps and see how we work. Before starting out we scan the slope to try to predetermine our course down it. This pausing to estimate the situation is the mark of the intelligent skier, be he beginner or expert. Many skiers, in their anxiety to get started, launch themselves down the slope and are immediately in trouble because they don't know where to go and there isn't time to figure it out en route. By the same token, once the tentative line is chosen the good skier will be constantly looking ahead to continue the job of estimating what lies before him. It is a good idea, before starting out, to plan the first three or four turns — that is, where they will be made and at about what speed. With this plan in mind, it is easy enough while executing the first three or four turns to look ahead and plan the next few. The aim of this preplanning is to assure control and rhythm — the latter an absolute essential in skiing over bumps, where timing is of the essence. In this connection, it is not timidity but only good sense to choose not the worst and most difficult and rugged bumps, but those which provide the easiest turning. It will usually be rugged enough!

Once you start out, the traverse position is again solid and squarely with the skis, the uphill ski leading and the knees whippy and elastic. Poles are gripped firmly and are held at the ready for placing in the turns. Some people, in attempting to use the poles in bumpy terrain, tend to swing them from the wrist like pendulums. Obviously, when one is reaching ahead to plant a pole it will be swung forward a certain amount, just as it will be swung back a certain amount when it leaves the snow at the end of the turn. However, this pendulum motion should be kept to a reasonable minimum, since what is desired is stability and precision and these can be attained only with a firm wrist and a firm grip on the pole. Furthermore, the natural and correct

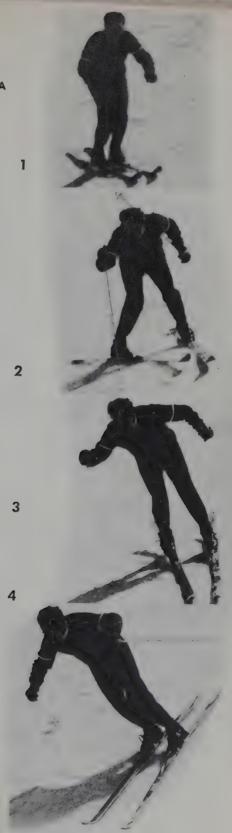
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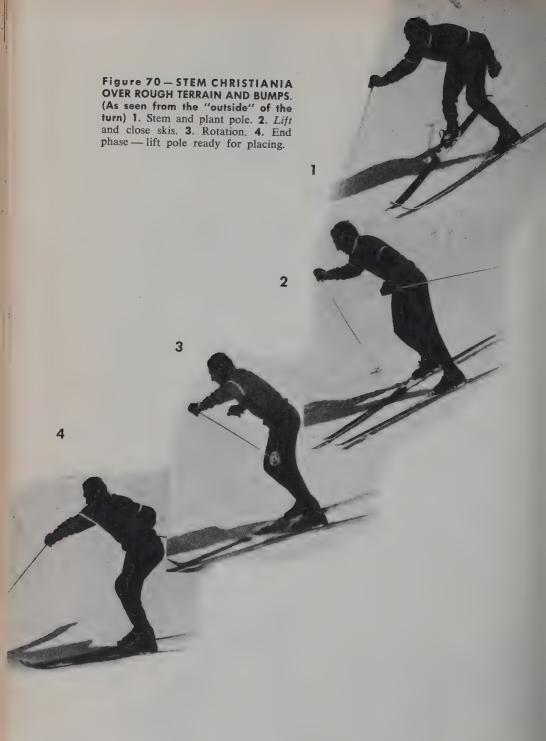
(As seen from the front)

- Traverse.
 Place pole and stem.
- 3. Lift!
- 4. Skis closing; rotation.
- 5. Outside hand moves ahead.
- 6. Left pole comes into position for turn to the left.









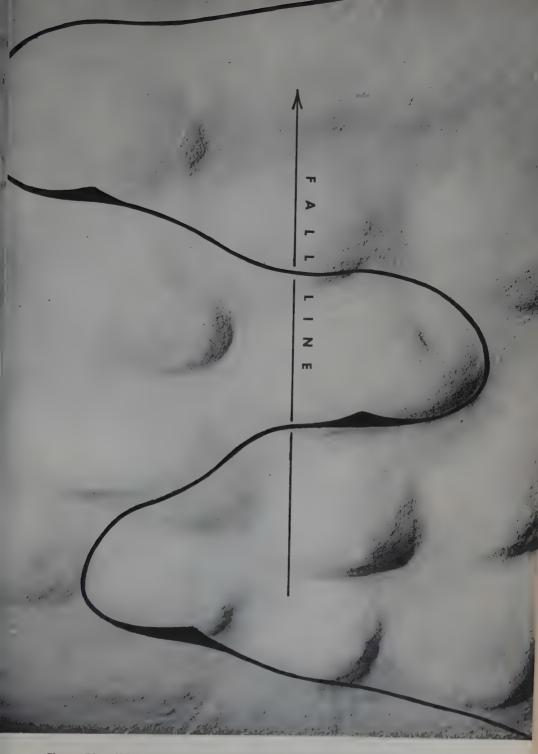
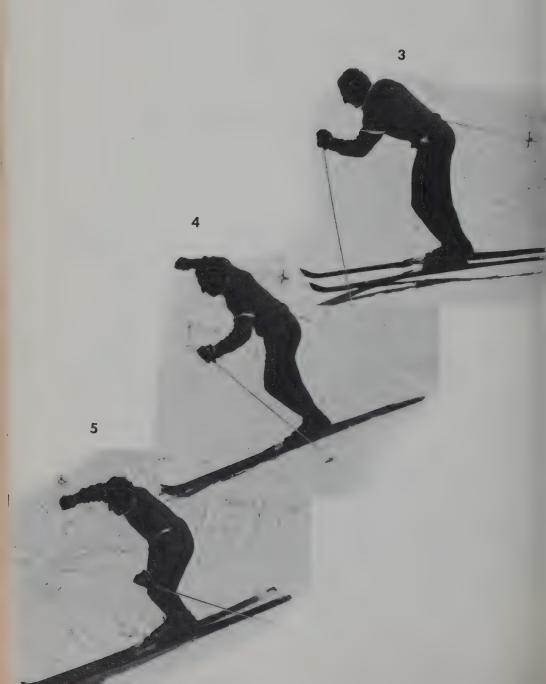
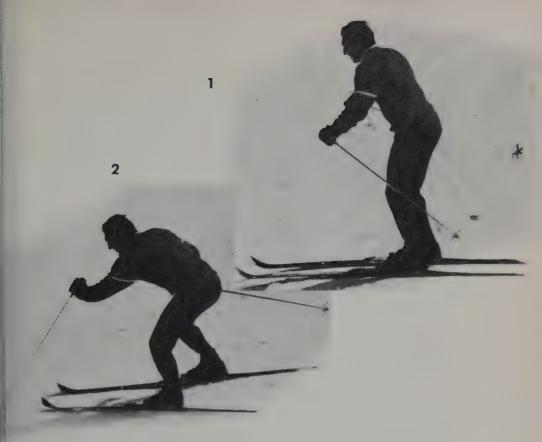


Figure 71 - STEM CHRISTIANIA OVER ROUGH TERRAIN AND BUMPS.

Figure 72 — STEM CHRISTIANIA OVER ROUGH TERRAIN AND BUMPS. (As seen from the "inside" of the turn) 1. Traverse. 2. Stem and place pole. 3. Lift off the top of the mogul. 4. In the center of the groove, skis are parallel. 5. In the outrun of the groove, preparing for the next turn.





action of the upper body is encouraged by the arcing reach of the complete arm, from shoulder to hand, rather than by keeping arms and shoulders rigid and swinging the pole from the wrist.

You are now approaching the bump where you have planned your first turn. As you get to its top, you simultaneously stem and plant your pole, swing with good rotation, close skis, and you're in your new traverse. You will notice that we did not mention lift. Of course you will lift; you have been having lift dinned into your ears since the very early parts of this book. But because of the lifting action provided by the terrain, your lift will be comparatively confined. In fact, by now it should be a natural and automatic part of your skiing rather than a thing you consciously strive for in taking off from the top of a mogul.

If you have executed this first turn correctly, you will shoot out of the groove following the turn in perfect position for your next turn in the opposite direction. Out of the groove, up the mogul, stem and pole plant, confined (that is, moderate) lift, swing, and you're back in the next groove ready for your next turn in the other direction. Properly executed, this sort of descent will not only be effectively handled by you but will give you a delicious sense of floating — almost of flying — when you initiate your turns; but this delightful sensation must be bought with correct timing, fast action, springy knees, quick — almost "kicky" — lift, and correct weight shift from ski to ski during the tight christie turns. There is one other important way in which this stem christie differs from the earlier open-slope stem christie and the earlier-described pole christie. In the christiania under discussion over bumps and moguls, the pole is actually used not only as a timing device but also, as needed, for additional support.

Since it is not too likely that you will have success in your first attempts, it may be valuable to list here the eleven most frequent causes of failure.

- 1. Many skiers are so pleased at having executed the first turn that they fail to follow through rapidly enough to be in position for the next turn when it is time to execute it.
- 2. Many skiers who have been cautioned against trying to use the pole as a brake in their earlier efforts are now afraid to make adequate use of it as a stabilizer in turning over moguls.
- 3. Although you can control your speed by quick, short sideslips in the traverses, once you are in a groove don't try to check your speed or your ski tips will catch on the side walls of the surrounding bumps. Similarly, if in turning into a groove you try to shorten the radius of the turn in order to check your speed, you will find yourself over-rotating and again the ski tips will catch. Once in the groove, don't fight it ride it, glide it.
- 4. Be sure to confine your lift so as not to extend your knees too far. You need them flexed for the fast action which immediately follows the lift. Let the mogul do most of the work for you.
- 5. Hold your poles firmly and reach with the arms, not by using the pole pendulum fashion.
- 6. Start your stem christies over bumps from a fairly shallow traverse. Don't attempt to follow the fall line.
- 7. Don't let the inside ski of the turn move ahead more than three to four inches, as this might cause it to catch the side wall of the bump you are turning away from. Advancing the ski farther than this will also render it virtually weightless, so that if it does catch on a small unevenness, the skis will scissor open disastrously.
- 8. In attempting to control speed in the groove, some skiers try to ski

on the uphill wall of the groove instead of on its floor. Hugging the side wall of a bump is a sure way to have the skis slip out from under you. Stay in the groove and if your skiing position is correct the acceleration will be exhilarating instead of frightening.

- 9. Never attempt to stem in the groove. Wait until the groove opens up.
- 10. Don't exhaust your knee action too soon in the turn; gradually sink from your lift position as the turn progresses, so that you finish your forward rotation in the groove and ready for the next lift at the top of the next mogul.
- 11. If you're going too fast for comfort and there is not enough space between grooves for a sideslip check during the traverse, look ahead for alternative routes over and around moguls to make your descent shallower and farther from the fall line.

PARALLEL TURNS ON BUMPY TERRAIN

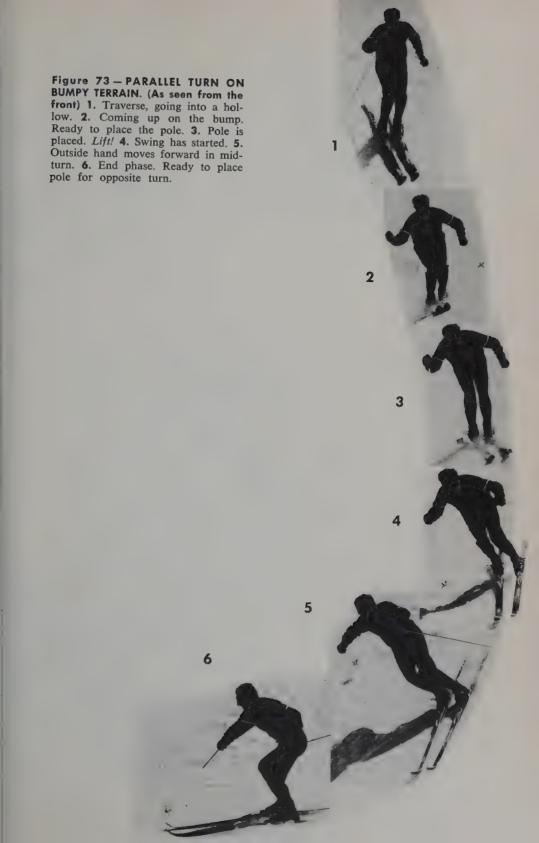
The skier who has mastered the parallel turn should find it a great joy to ski moguls employing this turn. Very briefly, what the parallel skier does is to use the walls of the moguls just as a racing driver uses a banked turn on a speedway. Thus, each bump or mogul will help tremendously in initiating and completing the parallel turn. The two major ways in which the parallel descent of bumpy terrain and the stem-christie descent differ are: (1) The parallel skier skis somewhat closer to the fall line; (2) since the skier's speed is greater, he initiates his turns before reaching the tops of the moguls. In general, the parallel turn as employed over bumps differs from the stem christiania as employed over bumps just as the two turns differ on flat terrain. That is, the use of the pole for timing and stability, and as the center of the radius of the turn, is used in the parallel turn for bumpy terrain just as it is used in the stem christiania for bumpy terrain. Similarly, too - and even more so - the lift is quite confined, since the combination of speed and moguls does the lifting for you almost entirely. Should you use exaggerated lift at good speed in such terrain, you'd find yourself flying through the air instead of executing a turn.

Figures 73, 74, and 75 show parallel turns made on steep slopes with rough snow and among moguls. Figure 76 shows the double-pole

parallel turn, in which both poles are used simultaneously, for even greater stability, when extremely rough conditions are encountered at speed. Its execution is much the same as the single-pole parallel turn; note (in Figure 76) that shoulder action is not inhibited by use of both poles. Figure 77 shows the course of the parallel skier down a slope studded with moguls.

Now let's consider an actual beginning of a bumpy-slope descent for the parallel skier. First — and again we are consciously repeating ourselves in the hope of driving home this important lesson —look ahead and plan ahead before taking off. The course you choose is a little closer to the fall line than with the stem christiania. Approaching the first bump with flexible and elastic knee action, shoulders square above the skis, arms held somewhat away from the body for balance, and poles at a slight angle and firmly gripped, and with the uphill ski leading by about three inches, the parallel swing with confined lift is started as you approach the top of a bump. This confined lift, though slight, is not dragged out but is short and dynamic, a definitive and rapid movement. Rotation, too, will be confined. The weight distribution is about 60 per cent – 40 per cent, that is, with 60 per cent on the outside ski.

You will recall that in the stem christie the turn was completed before entering the groove and the skier went down the center of the groove. In the parallel turn, the end phase of the turn is completed in the groove with the skier perhaps one-third up the downhill wall of the groove in the typical banked parallel position — only now the banking is the result of the shape of the groove rather than the edging of the skis. When the skier comes out of the groove, he will be ready for his next swing in the opposite direction. In this turn the danger of over-rotation is greater, since everything must be done more quickly and an over-rotated end phase will not find the outside pole ready for the next turn in the opposite direction. If you are late with the outside hand reaching with its pole for the next bump, your body will be behind your skis and you will not be in a position to make the next turn safely. The correct parallel turn on bumpy terrain demands that the short, confined lift be made with both legs and both knees which will insure keeping the skis parallel. Once this timing is properly mastered the turn is deliciously easy, since it is the centrifugal force of the skier which permits him to use the wall of the groove to bank his turn effortlessly. In fact, this centrifugal principle makes it possible





to ski parallel without skiing tremendously fast. Given good balance, good timing, and a little practice, it is the easiest parallel skiing there is.

Now comes a very important refinement in the parallel skiing of bumpy terrain — one which we have never seen explained anywhere else. We have chosen to call it the "hook." The hook is used to control the speed in the parallel descent of bumpy terrain. Here's how it works: Just before the lift, the skier performs a very short and energetic parallel sideslip which almost instantly is terminated with sharp edge bite. This is the hook and it has several advantages in addition to checking the speed. In the first place, it provides the skis with a firm take-off platform which makes the short, "kicky" lift more secure and easier. In the second place, if the skier is employing the elastic rhythm that he should, the "hook" will provide not only a platform but an actual springboard which in effect launches him into his turn. As we said, this sideslip is short and abrupt, with sharp, firm, instant biting of the edges at the end of the short skid, immediately followed by the springboard thrust from the launching platform the hook provides.

There is another alternative open to any skier who wishes to avail himself of it. This is to forget the hook, to prolong and exaggerate the lift, and to plant the pole tip so far back that the skier's body will fall well behind the skis in timing. This maneuver is employed when the skier desires to leave the terrain and sail into the woods. We assume no responsibility for the resulting damage to the local forestation.





Figure 75 — PARALLEL TURN ON BUMPY TERRAIN AND VERY ROUGH SNOW.

1. Traverse at the ready. 2. Crouch on upgrade, ready to place pole. 3. Pole is now planted. Lift! 4. Swing! 5. Mid-phase of turn in the groove. 6. Continuation of turn with the skis banking against the side wall of the bump.





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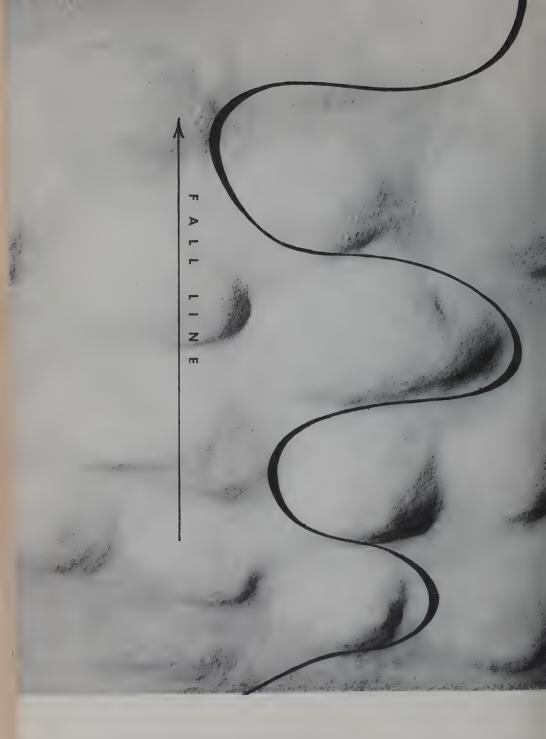


Figure 77 — PARALLEL TURNS OVER BUMPS.

AIRPLANE TURN

This turn is extremely useful for skiing bumpy terrain studded with moguls, but it is not essential to the recreational skier's repertory. However, it is highly recommended. It may seem to the beginner or the intermediate skier that his greatest joy would be to descend a slope day after day in perfect, linked parallel tempo turns. He would not believe it, but it is true that once he has achieved this so-much-desired goal he may find himself wishing for some variety. This the airplane turn will provide. Thus it has the double virtue of being extremely useful on bumpy terrain and of giving the skier something a little different and a little more spectacular to do.

A fair degree of expertness is required for the correct execution of the airplane turn. Once this is attained, however, the turn itself is not difficult. Generally, it originates out of a fast traverse. The skier literally takes off from the top of a mogul, executes his parallel turn while in the air and lands in the groove, lined up for the finish of his turn. The airplane turn is extremely useful for clearing several close-together, very sharp bumps at once. Thus employed, the turn requires the kind of judgment of speed and distance that only experience can give you. However, this experience can be readily acquired by learning the turn over a single bump. (See Figures 78 and 79. In 78, observing shadows will enable you to gauge the skier's altitude.)

Let's go through the motions of one such airplane turn. Let's assume you've chosen the bump from which you will take off and you are approaching it in good traverse position, at considerable speed, looking well ahead, weight nicely distributed on both skis, knees elastic. From the normal crouch position as you come up the bump, you prepare to plant your pole at the very top of the bump, where you will lift up strongly and with full extension of the legs (remember, you want to fly!) and the combination of the terrain and the vigorous lift sends you into the air.

Once you are airborne (but not waiting; this is all one continuous motion), your outside hand and arm come around exactly as in the parallel turns on the ground, an arcing motion accompanying the turning of the skis, which is accomplished in the air. While executing the turn you will also be drawing up your knees so that the parallel skis are close to the body and as far from the surface of the snow as you

can get them. Below you, now, is the top of the bump you are jumping over; the drawing up of the feet close to the body is important to make sure that you clear this crest, since it is your purpose to land in the groove on the other side of it. Now you prepare for the landing, which will not be difficult if your body has turned to the correct angle for skiing in the landing groove. But before you land, you straighten your legs somewhat (although you must not straighten them all the way and lock the knees, which would make your landing an upsetting jolt). Your purpose is to extend your legs so that as the skis come down onto the snow you will have ample reserve spring in your knees and legs to absorb the shock. Just as a ballplayer in catching a fast ball lets the glove come back to stop the motion of the ball gradually, so you let your knees flex so that you settle onto the snow instead of pounding down onto it. If the knees are locked, you can't do this. Similarly, if the knees are still tucked up when you land you won't have any elasticity to absorb the shock. As we said, judgment is required — and fine timing — in estimating the distance to be traveled and the speed required, and, very importantly, in making sure that the skis are lined up with the groove in which one is going to land. But once these niceties are mastered, the airplane turn is one of the most delightful in the advanced skier's repertory, since it gives him the ultimate sensation of floating.





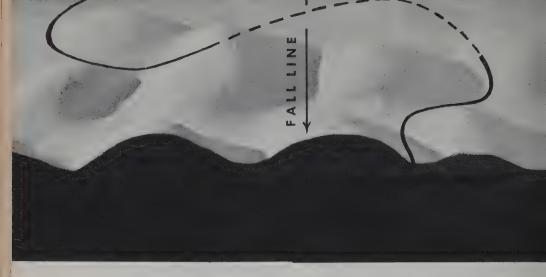


Figure 79 — AIRPLANE TURN OVER A BUMP. (Dotted line shows actual flight.)

JUMPING AND PREJUMPING

There is one other maneuver in high-speed skiing over bumps, especially when the slope is steep, in which the skier voluntarily leaves the ground to fly through the air. This is the jump. It is used for two purposes: (1) to pass over one or more in a series of close-together, sharp-sloped bumps, by jumping over them; (2) to safely negotiate a very steep drop-off. The jump itself is made as in the airplane turn — only without turning. As in the airplane turn, the skis are drawn up to the body during flight and the legs are then extended to act as shock absorbers in landing.

The critical action is the timing of the take-off. If one does not prejump a sharp drop-off, the flight path extends to its leveler runout — with a resultant shock in landing — and the time in flight is protracted to the point where the skier's control may be drastically diminished. If, in jumping over close-set bumps, the jump is made too late, the impetus provided by the take-off bump will be lacking and the flight will be too low and too short. Figure 80 shows the correct take-off locations for these jumps.

MOGULS AND FORM

Throughout this book, we have stressed the importance and the virtues of executing ski maneuvers with good form. However, it is a sad fact that many skiers so overdo attention to grace and beauty in their skiing that they become prima donnas of the slope and sacrifice fun, speed, and capacity to handle a variety of terrain in the interest of always seeming to look perfection itself. The fact is that on steep and bumpy and rough terrain, even the world's greatest skiers will find

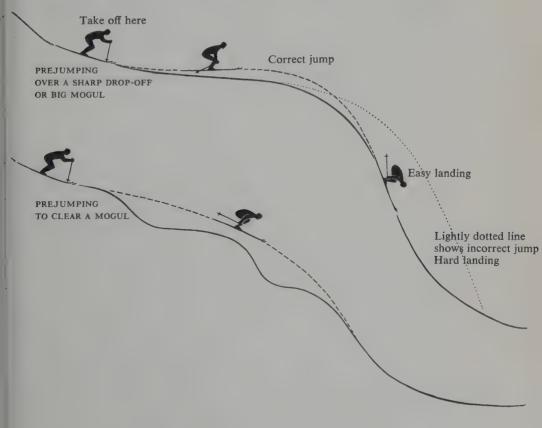


Figure 80 - JUMPING AND PREJUMPING.

themselves momentarily in somewhat less than perfect postures. This is only normal; the rapid adjustments of every part of the body in maintaining equilibrium at high speed over bumpy terrain will inevitably produce some awkward postures. Undesirable as these may seem, they're far superior to falling down with a thud with the skis perfectly parallel and the arms exactly as they are pictured in the travel brochure. Alternatively, there are skiers who might be likened to hot-rodders whose sole aim is to come careening down the fall line willy-nilly at what is too often literally breakneck speed. You, the good and sensible skier who skis for fun and not merely to impress the onlookers or to break records, will choose the sensible middle course.

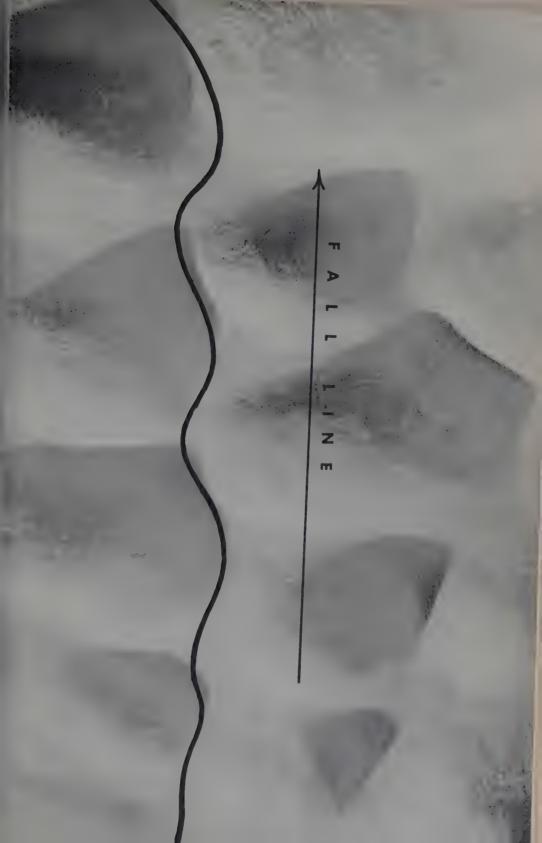
LEARNING WEDELN

Wedeln has become a magic word in skiing. Everybody talks about it, some people know what it is, some people know how to do it, some people do it for fun, some people do it all wrong without realizing it. There are actually excellent uses for this maneuver.

The term itself, translated into English, is extremely descriptive. Wedeln might be roughly translated as tail-wagging; the maneuver on skis consists in wagging or fanning or slinging the tails of the skis from side to side while the tips remain in the direction of forward motion. The function of wedeln is threefold. First, it is employed in taking the shortest (closest to the fall line) route down a bumpy, mogul-studded run. A wedeln skier's course down a mountain approximates the path that would be taken by a liquid poured from the top. (See Figure 81.) Second, it is employed to control speed in descending corridors and narrow trails, where it performs the same function at high speed that the snowplow does at low speed, i.e., it gives the skier control and the means for retarding his speed. Third, wedeln is employed in slalom.

Before attempting to learn wedeln, something of its dynamics must be understood. The side-to-side fanning of the skis is accomplished with lift. The distance of the side-to-side travel of the tails of the skis is short, the motion is rapid, and at the end of each "wag" the skis are

Figure 81 - WEDELN AMONG BUMPS, CLOSE TO FALL LINE. (See opposite page.)



strongly edged so that they bite in and instantaneously provide a pushoff platform for the wag in the opposite direction. Thus, with quick
lifts between wags, the ski tails are wagged back and forth rhythmically from "platform" to "platform," with no pause in between. This
tail-wagging with lift is accompanied with use of the poles, much as
they are used in doing the stem christie and the parallel turn over
bumps. You may have heard — and it may be — that one need not be
a very advanced skier to learn proper use or execution of wedeln. We
beg to differ with this opinion. It is our belief that the true and correct
wedeln is best learned after one has attained sufficient skill to bring to
it the necessary rapid and exact timing and knowledge of edge control
which it requires.

WEDELN EXERCISES

There is one way to initiate yourself into the mysteries of wedeln which is physically rather exacting but may well pay off in quickly earned dividends. You might wish to try it. If so, pick a gentle slope which is smooth and hard packed. Hold yourself in the fall line with skis parallel by planting both poles to the sides of the ski tips at about the point where the shovel touches the surface. Gripping the poles firmly and letting the pole straps support a good part of your weight, try the wedeln "in place." Maintaining the position you are in with the poles, you fan the tail ends of the skis from side to side. Do it this way: Lift and sideslip the back ends of the skis to the right, edge sharply, take off from the platform thus provided immediately, with lift, and swing the tails of the skis to the opposite end of the arc. Don't pause there, but again lift, wag, edge; lift, wag, edge; lift, wag, edge; lift, wag, edge -- until you get the rhythmic feeling of wedeln. It is important to get this fanning, wagging motion rather than an abrupt jumping of the back ends of the skis. The tails of the skis gently stroke the snow, they are not lifted clear of it. This may be more difficult to accomplish in the standstill position than in motion, but it should be borne in mind and striven for just the same. In motion, the stroking (as opposed to jumping) is natural and much easier. You will notice that the pressure on the poles alternates just as the edging of the skis alternates. When you take off from the left wag toward the right wag, you not only use lift, you put some weight on the left pole. This is not a bearing down, but a firm contact with the snow for a slight assist and added stability. And vice versa with the wag from right to left, and the weighting of the right pole as you take off for the wag in the other direction. (See Figure 82.)

At this point you will notice something most interesting. In making these arcs from side to side rapidly, you will notice that your body naturally assumes a slight sideward curvature, the so-called "comma position," which is perfectly natural and will come to you automatically when you wedel. It is the forced and self-conscious exaggeration of this comma position which is affected by extremists and which those new to this maneuver find so awkward and difficult.

You will notice something else when you wedel in place. That is that the shoulders play virtually no part in the execution of the maneuver. But please note that word "virtually." Shoulder action is definitely there in wedeln, though it is extremely confined and, one might say, fractional; but the principles of shoulder action and rotation which have been stressed throughout this book still have their place (in a miniaturized form) in wedeln — and in the same way. If you have not already heard it, you will probably soon hear that reverse shoulder action is required in wedeln. It is our belief that this is the opposite of the case. For the correct touch-timing and instantaneous support that the pole provides, the confined but correct shoulder action is essential.

Any reader who doubts this need only observe closely the accompanying pictures (page 193), which were shot with a robot camera and show Anderl Molterer, one of the all-time greats, employing wedeln at high speed on rough terrain. The robot camera was able to stop the action in extremely fast wedeln, which has the grace and power — and the speed — of the tail of a trout in fighting his way upstream.

If you had the determination and the physical strength to practice the wedeln exercise in place, you are now ready to try another excellent exercise in preparation for the proper use of wedeln in your skier's repertory. This is practicing wedeln during a shallow traverse on a hard-packed and fairly gentle practice slope, which will give you an opportunity to try the wagging of the skis and the use of the poles for exact timing without being distracted by the need to negotiate a difficult slope. Thus you will be able to practice in almost slow motion, you will be able to practice getting up speed in the wagging, and you will discover that the slower the wedeln, the wider the sweeps of the heels of the skis. By the time you are able to wag pretty quickly, with

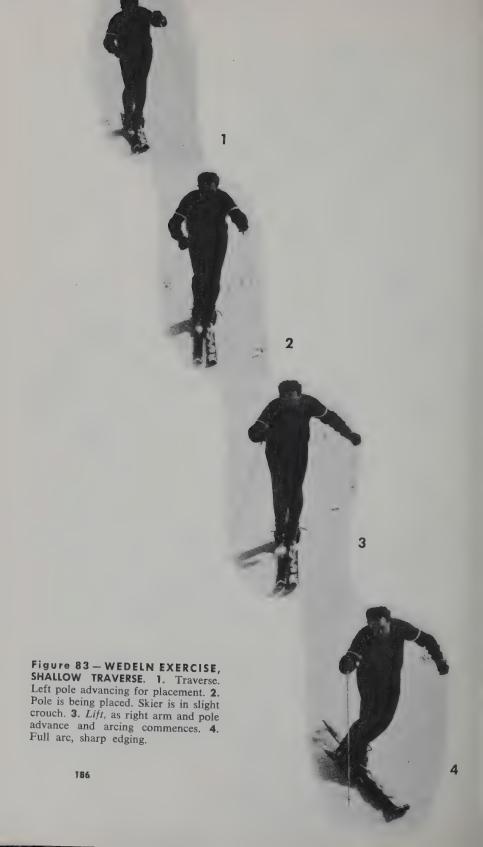
good timing, on the shallow traverse, you are ready to learn to put the wedeln to use. (See Figure 83.)

Before getting on to that, some further words about hand and arm position are required. Both arms are held forward of the body. The elbows are kept flexed. This is important. If in reaching out to plant the pole near the tip of the ski you extend your arm (like a boxer jabbing), or if you pendulum the pole to get its tip forward, you will throw off your timing and work your weight back on your skis. Whereas if the entire arm is used in advancing the pole, you will have the correct forward arcing of the outside arm, hand and pole necessary to wedel rhythmically and correctly.

In the wedeln you need not worry about the removal of the pole from the snow when it is time to bring it forward. The timing is so fast and the motion is so rhythmical that the waggings and the pole placings interflow—the pole whose weight has just been relieved naturally leaves the snow as the arm on that side comes forward for the next placing. Again, a study of robot photographs shows that although there is only a vestige of rotation in the shoulder action, the individual shoulders do move forward as each pole is placed; that is, the outside hand in coming forward draws the shoulder with it, since shoulders, elbows and wrists form a firm linkage. (See Figure 84.) Of all the ski maneuvers, wedeln puts most emphasis on leg action and pelvis action. Comparatively speaking, shoulder motion is nonexistent. But the principle of having the outside hand and arm moving with the outside ski remains unaltered.

Now we come to another preliminary exercise for developing a good wedeln technique and one which may come as quite a surprise to those who are not familiar with this book's demonstration of the fact that a consistent teaching technique employs every maneuver to the same end: controlled skiing.

We urge you to look far back toward the beginning of this book, where you will find a diagram of linked rhythmic snowplow turns in the fall line. Pick a good slope for this wedeln exercise, do the snowplow turns the way you learned to do them 'way back then — that is, rhythmically and linked — but this time hold your arms and poles in the position you learned in the preceding wedeln exercise. Make your linked snowplow turns as you would without the use of poles, but this time employ the poles to help in lift, weight shift and timing. Each time you shift your weight, plant your pole — always the inside pole



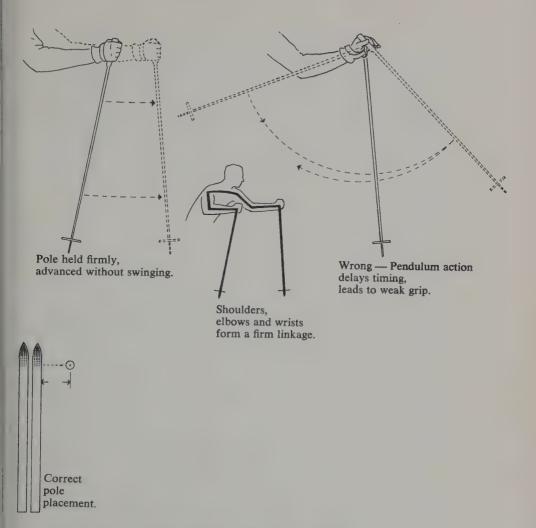


Figure 84 - POLE WORK IN SHORT SWINGS AND WEDELN.

toward your turn. We know of no faster, better way to develop the correct pole work for fast wedeln. In fact, if you make your snowplow V smaller and smaller, and your linked turns faster and faster and shorter and shorter, you will be very close to wedeln already. All it needs is to sling the skis, tails only, parallel and together, instead of in the snowplow V.

These three wedeln preliminaries — wedeln in place, wedeln in a shallow traverse, and wedeln emanating from linked snowplow turns — cover the main phases of the finished maneuver. Having learned them,

you should be completely ready to try real wedeln. But here again, we wish to stress our belief that it takes a skier who is at least the master of the stem christiania, and is beginning to ski parallel, to properly execute the wedeln. Undoubtedly there are those who have learned it at an earlier phase in their development. Just as surely, there are those who go through a maneuver which they believe to be wedeln and which is not. Undoubtedly there may be some talented teachers who can teach wedeln before the point at which we believe it should be learned. But it is our conviction that, for the vast majority of skiers, this is a maneuver suitable only for the advanced skier.

WEDELN

The dynamics of wedeln depend on precise control of body weight. Once this is understood, one can cut through a great deal of the obscure language which so frequently is used about wedeln — to the ultimate frustration of the skier. A simple formulation of this matter of weight control is as follows: The wider the arc of the fan, the more the body's weight must be on the heels. The shorter this fan or arc, the farther forward the weight must come. Finally, in the "trout-tail" wedeln down the fall line, with short, extremely rapid arcs, the entire aspect of the body is forward. This is the position in which rapid and precise pole work is possible. It is also the only position that makes it possible to rapidly fan the tails of the skis from side to side while the tips remain in the fall line.

Now let's try a few wedeln turns. Select a sufficiently easy slope so that you can keep your skis pretty much in the fall line without being afraid of picking up so much speed that they will run away from you. Although the major purpose of your wedeln will be to ski the fall line on bumpy slopes, for your first turns you will want to have a smooth slope so that you can perfect your wedeln technique before subjecting it to the test of skiing among moguls. Let's start out with a turn to the right. Your skis are in a traverse position close to the fall line. Armand-pole position is forward in preparation for the actual pole work. Knees are elastic and springy, ready to kick off the first turn. You don't need a great deal of speed for this and subsequent early tries. Now, when you are ready to make your right turn, wedeln style, crouch slightly, place the right pole in the snow opposite the shovel and about

one foot to the side of it, lift sharply and quickly to arc your parallel ski ends over to the left; simultaneously, the left arm and hand come around with the pole to be planted for the left turn that you will be linking to the right turn. At the end of the arc to the left, edge sharply and energetically, thus providing yourself the springboard platform for the fanning of the skis in the opposite direction for the coming left turn. There is no pause at the ends of the arcs; the biting in of the edges — and pole placement — are immediately followed by the lifting take-off for the fan of the tails of the skis in the opposite direction.

Now let's suppose that you've made two wedeln turns, linked, one to the right and one to the left. How do you account for the fact that they did not work too well? (We can be pretty sure that they didn't don't be discouraged, they never do at first.) Probably your trouble was somewhat as follows: Most likely the skis picked up too much speed and you found yourself "hanging back" - resulting in, among other things, too much weight on the heels of your skis. Why did the skis pick up this extra speed? Because you didn't make your arcs wide enough. And why didn't you are more with the back ends of the skis? Because your edging, which was to provide you the strong platform for the quick lift, was not strong enough to give you the kind of lift required to swing a full arc. Thus, your arcs were short and feeble and the skis picked up speed. You may well ask why the increased speed defeated the wedeln turns that you first tried. The answer is that in all likelihood you were unable to have your pole-timing keep pace with the increased speed. A characteristic of wedeln is that the faster the skier's motion down the slope, the faster the pole movement must be. This facility in pole action and timing must be learned gradually, building up speed as you go. The minute the timing of the pole action falls behind the execution of the wedeln, the skis get ahead of the skier and he is defeated.

Don't be daunted, let's try again.

Traverse, elastic knee motion, slight crouch and pole-planting, kick-lift to bring tail ends of the skis to the left, edge hard at the end of the arc, left arm and pole follow the arc motion of the skis and the left pole is planted, kick-lift again and the skis swing to the right — Oops! What happened? Something obviously went wrong; most likely what you did was jump the ends of your skis. The skis must not leave the snow; the motion must be smooth, with each phase interflowing with the next. Jumping the tails of the skis yields a hard and jerky performance

which has very little to do with the timing and beauty of wedeln and throws the skier off balance.

So, let's try again. But before we do, let us tell you something about your appearance when you made your more successful second attempt. Believe it or not, at the moment when you applied the hard, sharp, instantaneous edging that is so necessary, you unconsciously "kinked" your knees toward the slope and thereby attained, without trying, the correct comma position. It is our assertion that to strive for this comma position without understanding its dynamics, or realizing why the body naturally assumes it, has nothing to do with the learning of good controlled wedeln skiing.

Now that we've had this clarification of the comma position, let's get back to another attempt at the correct wedeln. This time, try a cadenced counting out loud. If this embarrasses you, count to yourself. The purpose of the count is to give the turns that elastic rhythm and precision of timing which characterize wedeln as done by experts. Count "ONE-and-TWO." Like this: ONE (crouch, plant pole), and (arc skis), TWO (edge sharply, plant other pole). Don't stop. Keep going ONE-and-TWO, ONE-and-TWO, ONE-and-TWO. Get the rhythm, make your motions precise but fluidly joined and not jerky. The whole body is expressive, as in dancing. When you get up speed, you'll find a better count for you is to omit the and and use only the One-Two, One-Two, One-Two.

Now let's take time out (while you catch your breath) for another important digression into the dynamics of wedeln. Again, our purpose will be to clarify what has too often become obscured. If, as we urged earlier, you do not attempt to learn wedeln until you have achieved the refined stem-christie or parallel-skiing stage, then you will automatically be advancing the inside ski in the wedeln turns without thinking about it. It is inconceivable to us that anyone who has progressed even as far as a fair stem christie will not have this advancing of the inside ski of a turn as an integral part of his technique, done without thinking. However — and this is important — it sometimes happens that well-meant instruction in wedeln focuses attention on the importance of advancing the inside ski. This can have most unfortunate results — the skier becomes self-conscious about leading with the inside ski, so he actually thrusts it forward. Simple physics tells us that the countereffect, i.e., the reaction to this action, is to throw the body

back. The normal and automatic advancing of the inside ski (about three inches) is correct and permits the continued forward aspect of the body so necessary to wedeln timing. The conscious thrusting forward of the inside ski too far sets the body back, throws off the timing, ruins stability and leads to failure.

In this connection, we might point out that since every isolated motion in skiing must be a smooth-flowing part of an integrated whole, so an error in any one phase leads to other errors in the whole. Here is how this interdependence can work against you through the making of one error. The thrusting forward too far of the inside ski puts the skier's weight so far back that lift alone can't unweight the heels sufficiently for correct fanning. The result is that, in his riicklage position. the skier must jump instead of lift in order to unweight the backs of the skis enough for fanning. We have been stressing the importance of pole work and timing. We would like to stress it again — it is virtually impossible to overstress it — and would like to point out that the forward aspect of the body and forward motion are essential for correct pole work and the critical timing it requires. This is one of the secrets of correct wedeln. Without it, you will be unable to wedel through bumps. Without it, you will also have to think about the weighting of the outside ski instead of having this happen automatically.

Apropos pole work: you will find, as your wedeln is perfected, that the speed you're going determines, to a degree, the placing of the pole. In a fast wedeln, the pole tip enters the snow as far forward as the tip of the ski; in a slow wedeln, you may find the correct pole position somewhere between the tip and the binding. In a fast wedeln the pole will automatically be out of the snow and starting forward again before the binding catches up with it, or right at the binding; in the slower wedeln, the pole tip will leave the snow somewhat later.

EMPLOYING WEDELN IN SKIING BUMPY TERRAIN

Now that you have mastered wedeln on smooth slopes and have become proficient in the rapid and precise timing and the elasticity of movement required, you are ready to employ wedeln in negotiating the terrain for which it was invented. We might say here that to wedel on a smooth slope of not too steep grade can be done for fun and amusement — but it is not necessary. It is when the expert skier wants to negotiate a downhill run which is studded with moguls that wedeln comes into its own. The fall line is his ideal course. Since the fall line is theoretically straight, the exact following of it through moguls is, of course, impossible. It is the aim of the skier who wedels to select and negotiate the straightest possible course down the slope, thus achieving the closest practical approximation of skiing the fall line. (See Figures 85 and 86.)

How is this done? You will recall that we have been talking continually about the importance of making a pre-evaluation of the possible course before taking off. For the expert skier, this is an automatic part of his repertory; he looks at the slope and instantly analyzes the opportunities it offers for rapid descent under control.

The stem-christie skier, skiing among moguls, follows the grooves. The parallel skier uses the lower parts of the walls of the grooves to bank his turns. The skier who wedels also follows the grooves, but he may fling the tails of the skis against the side walls to check his speed should he need to. Usually, however, he does his checking in those brief instants when one groove opens out just before the next one begins.

In skiing among moguls and at high speed, the skier who wedels seems to dart rather than turn. His motion is less that of a swooping bird and more like the trout we talked about earlier, who can, through rhythmic movements of his tail, maintain his place in a fast current or dart from side to side. The skier who knows wedeln shows prodigious speed and timing in the rapidity of the tail-wagging of his skis and the placement of his poles. He does not have time to hesitate in his choice of course. His decisions are made instantaneously — he employs his wedeln for maneuvering rather than for checking. Skiers themselves, in talking about this attitude of total readiness and split-second timing, frequently use a German word, wendig, which we might approximate with the English words, "flexible," "maneuverable," or the notion of optimum movement. The aim is speed; the means to it is a fluid and flexible control which permits the skier to seize every variation in terrain, every alternation in possible course, every dip and leveling in gradient to impel him faster and closer to the fall line.

Of course, not all skiers who wedel always want to see how fast they can get down a mogul-studded slope. If they wish, they can make traverses; frequently they will keep the tips of the skis in a groove and



Figure 86 — FAST WEDELN. (From the back) 1. Fanning tails to the right. (Note outside arm and pole leading.) 2. End of arc. Ready to *lift*. (Note pole placement.) 3. *Lift* — and start of fan to the left. 4. Sharp edging produces normal comma position.



fan the heels somewhat up the side wall to check speed. In such circumstances wedeln might be likened to the constant delicate movement of the steering wheel of a car, which is the mark of the good driver who employs this means to compensate for little unevennesses and to have the feel of the car continuously in his hands — instead of just holding the wheel rigid and letting the car run, employing the steering wheel only for actual turns. Thus it will be seen that wedeln is not only a means of turning and of checking speed, but is, perhaps most importantly, a means whereby the skier is in constant intimate touch with the terrain over which his skis are gliding.

It is, however, in the very rapid wedeln (see Figure 87) close to the fall line that the skier who has learned his wedeln with good forward aspect of the body will appreciate the time and attention he gave to learning it. For now he can do the rapid arcing of the skis with very little effort, the ski heels being virtually weightless, thanks to his forward stance. Of course when the skier who wedels slings the backs of his skis against the walls of a groove to check his speed, he weights them sufficiently to achieve the braking motion. But as soon as the desired braking is thus achieved, his weight comes forward again where it must be in order to give him the weightless tails and the rapid pole work which distinguish good, fast wedeln.

Some pages back we talked about the prima donna of the slopes who would prefer to fall in perfect form rather than continue skiing and commit some momentary awkwardness. In the rapid negotiation of bumpy terrain close to the fall line, the true expert will quite naturally swing his poles and his arms into postures and positions which when caught by a stop-motion camera — seem to reveal poor form. Actually, it is the mark of good form to be flexible enough and elastic enough to make these instantaneously corrective motions. It is not infrequent for an expert skier to use two poles rather than one for that stabilizing instant at the launching of a turn or the initiation of a maneuver. (This, you will remember, we showed in Figure 76.) Certainly, in taking off for the prejump over a sharp drop, two poles can be very helpful. Two poles may also be employed in taking off in the airplane turn. In any case, the strong likelihood is that the well-trained skier who has a reasonable and logical technique will not have to worry too much about his form (in the "formal" sense) because it will be an integral part of everything he does on the slope.



Figure 87 — FAST WEDELN BY ANDERL MOLTERER. 1. Start of arc of tails to the left. 2. Arc completed. Pole planted in preparation for arc of ski tails to the right. 3. Arc to the right. (Note that outside hand follows motion of arc.)
4. Arc completed. (Note pole work and edging of skis to form springboard for arc to the left.) 5. Arc to the left.



Tows and Lifts and How to Ride Them

Because we know that climbing builds muscles and wind, we have not mentioned the easy way up until now, though we'd like a nickel for every reader who has turned to this chapter fairly early in the game.

Tows and lifts are extremely useful in two respects. They save the time and effort of climbing (which is of great importance to those whose skiing time is limited), and they give one a chance to rest somewhat for the next downhill run.

There is no reason why you should not use tows or lifts whenever they are available, provided you know how to climb if you have to, and provided you are in good enough condition to make the downhill run safely.

There are three main types of tows and lifts: the rope tow, the T-bar lift (double, or, when single, often called J-bar), and the chair lift. Riding them is not difficult, and observing how others do it is the best way to learn, but some pointers on the proper way to go up safely and without a spill are in order.

ROPE TOWS

The rope tow is an endless rope, going around two pulleys, one at the top of the hill and one at the bottom. The rope is driven by a motor, watched over by an operator who is alert to stop it if a rider falls and can't get out of the way of the next skier on his way up.

Usually, you will find packed tracks at the foot of the tow, made by other skiers. When your turn comes, get your skis into the tracks, then take off both wrist straps of your poles, and hang the poles over the wrist of the hand away from the rope. Wear your leather gloves or leather-palmed mittens even if it is a warm day. When you are set (and when you get the word from the starter, if there is one), put both hands loosely around the moving rope, and lean back a little as you gradually tighten your grip. If you don't do it gradually, the rope will jerk you off your feet.

There are two ways of grasping the rope, both satisfactory. One is with both hands in front of you. This has the disadvantage that, should the snow be high or the rope sag at any point, your poles may touch the snow and tangle with your skis. The other method is to grasp the rope in front of you with the near head, and behind you with the hand holding the poles. If you use this second method, which has the virtue of keeping the poles behind you, use an overhand grip with the hand in front of you, and an underhand grip with the hand behind you.

However you hold the rope, once you have a firm grip on it and are riding uphill, the procedure is the same. Keep your eyes ahead, looking for unevenness, for iced or worn patches in the tracks, and for a possible fall by someone up ahead of you. Your weight should be centered squarely on your skis; if it isn't, you risk having the skis slide out from under you, either ahead of you or behind.

It is imperative, when riding a rope tow, to remember the potential danger you are in from your poles. Three things are especially important to watch: (1) Be certain to keep the tips of your poles behind you at all times, otherwise they may dig in ahead of you and jab you or spill you; (2) keep your wrist straps from becoming entangled in the tow rope, a not unlikely eventuality since tow ropes have a way of twisting clockwise and counterclockwise as the tension on the spiraled hemp varies with the load; and (3) in keeping your pole tips behind you, don't trail them in such a way that one of your skis rides up on the snow rings, a sure way to fall down and an almost equally sure way to have the thongs of the ring cut or scarred by your steel edges.

If you should happen to fall, be sure to let go the rope so that you

won't drag, and roll out of the way of the skier coming up behind you as quickly as you can. Don't attempt to get up and grasp the rope again; ski down or climb the rest of the way up, and better luck next time. If someone falls in front of you and is unable to get out of your way, the likelihood is that the tow operator will stop the motor. Be prepared for this. When it happens, the rope goes slack, and if you have been using it to support part of your weight, you, too, will fall. Be prepared, also, to shift your weight so as to accommodate stopping. Once you are stopped, you can hang onto the rope to keep you from sliding back, but be prepared for the tow to start up again.

While riding a rope tow, keep the elbows somewhat bent, so that the pull is against flexed muscles and not against elbow and shoulder joints, and in order to be able to "cushion" any jerking of the rope.

Don't, under any circumstances, loosen your grip on the rope in order to go more slowly. This changes the spacing of skiers on the tow, which may mean that the rider behind you will get too close for safety, and the friction of the rope going through your hands generates heat which may be sufficient to burn the palms of your gloves.

As you near the end of the tow, prepare to let go and get out of the way of the next rider. There is a level surface which is usually well packed, and as you come up onto it, release the rope and use your momentum to ski away. Here you may want to use the step turn to leave plenty of room for others and yet stay on the level. Don't stop, don't pause to get your poles gripped properly, before moving well off from the tow and the people coming up on it.

T-BAR LIFTS

T-bar lifts are just what the term implies. A motor-driven cable runs high up, on pulleys mounted on towers, and from the cable hang metal bars in the shape of an upside down T if it's a double T bar, or an L (or J) if it's a single T bar. Whichever it is, the crossbar supports you and takes you up the hill while you hold the upright with one hand. The other hand carries both poles, again with the hand passed through the wrist straps so you won't find yourself at the top of the hill with one pole or none.

T-bar lifts always have a starter. He will tell you when to get into the tracks and show you how to stand. (There is frequently a board placed in the snow, against which you rest the tails of your skis.) As the T comes up behind you, the starter will pull it down and retard it just enough so that it comes gently against you, just below your seat. Lean back against it, but don't sit on it. As you come to rest against the T, grasp the upright firmly, with the hand nearest to it. The other hand holds the poles and keeps them away from the snow and especially away from the skis.

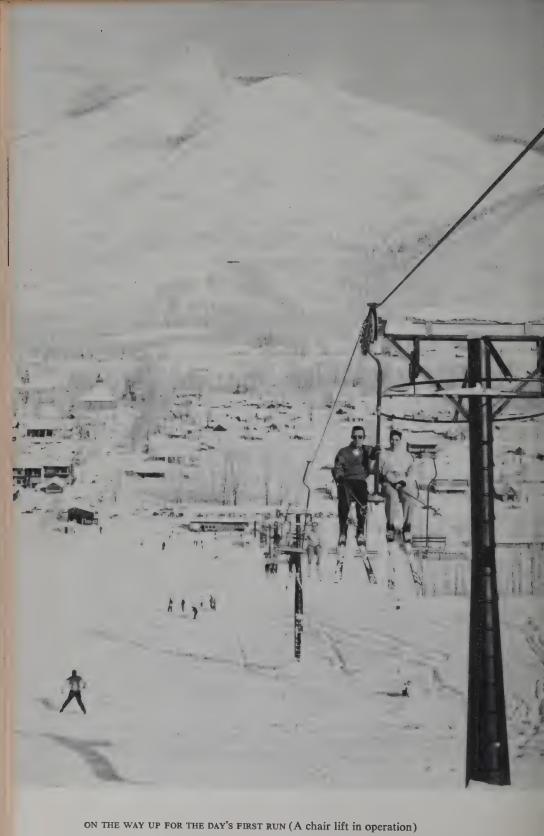
At the landing place, at the top of the hill, stand full on your skis and push away from the bar. Keep going until you are well out of the way.

CHAIR LIFTS

Like the T-bar, the chair lift operates from a high cable running on towers. Chairs are suspended from it, and in these the skier sits while he rides to the top in style. Chair lifts are deservedly the most popular, since the skies are clear of the snow and the skier really rests while he rides.

Again, there is a starter who retards the motion of the chair for you, after you have got into position. The poles are held in one hand, the other hand holds the upright which supports the chair. Some chair lifts have a bar rest for the skis; usually there is none, and the skier's feet hang in the air. On such chair lifts, one must keep the tips up. All too often, a skier gazing around at the scenery, or reliving his last descent, lets his tips hang down, they catch in the snow, and he does a nose dive off his chair.

At the top of the chair lift, the snow is graded so that the skis gradually come in contact with it. At the level getting-off place, push away from your chair as you rise, a little to the side if you can manage it, and get out of the way of the next man up. If the chair is of the type that has a foot rest, it is swung out of the way just before the summit is reached.



The Skier's Guide to Etiquette

It is not only by his faultless turns that you can recognize the fine skier, for his years with the sport have in all likelihood made the skier's etiquette second nature to him.

Your real skier is a gentleman or gentlewoman, and the first precept of his on- or off-the-slope behavior is uniform courtesy, helpfulness, and meticulous regard for the needs and comforts of others.

Before going skiing, he dresses properly and makes sure that his equipment is complete and in good shape. He knows that borrowing waxes, sweaters, bootlaces, screwdriver, or whatever else may be needed on the slope can be a nuisance to his fellows.

He will never, never keep a group making an early start waiting for him to finish his preparations. Once on the way, his equipment will be neatly strapped together, to make as compact and easily stowed a bundle as possible. On a ski train or plane he will conduct himself in the spirit of informal good-fellowship which prevails, but you will never see him drinking to excess, waxing his skis in the aisle, playing a portable radio too loudly, boasting about his prowess, pushing his way to the best seat, lolling in the diner when others are waiting.

On the slopes the good skier waits his turn at the lift, neither dawdling nor crowding the man before him in such a way that their skis may tangle. If he is climbing on skis, he keeps to the side of the trail or slope, always looking up and ahead to see what's coming. If he is climbing on foot, he does not clomp across the trail, leaving boot holes as he goes. And his skis are carried neatly and with due regard to the safety of others who might be injured or annoyed by a loosely swinging ski.

The real skier never yells "Track!" unless he has to. He uses his

brakes instead of his horn.* He does not consider it amusing to swoop as close as possible to beginners, in order to thrill them and scare them. If he falls, he immediately rises, fills in the hole he made, and gets out of the track of other skiers.

He does not jeopardize his safety or that of others by taking needless chances. He does not dare his less expert fellow to try a too difficult descent.

The woman skier who knows her etiquette carries her own equipment, fastens her own bindings, cleans and waxes her own skis.

No good skier endangers the limbs of his fellows by cluttering the trail with papers, garments, discarded wax containers, or anything else which might cause a bad spill and which makes the slope unsightly.

Figurative nose thumbing at the rules of a slope or at the warning of the local Ski Patrol that an area is unsafe or unready for use is not a mark of independent courage, but of childish misbehavior. Attempting a slope or trail which is marked "expert" when one is an intermediate shows one to be foolish, not brave, and a menace to other skiers as well.

^{*}It may seem odd to the reader to encounter words here - where we are discussing etiquette — about the importance of controlled skiing, which has been stressed throughout the book. Yet the fact of control is an important element in the practice of ski etiquette and one that is becoming far more than merely a matter of good manners; in fact, it has assumed the proportions of an absolute essential for human safety. As slopes become more populous, as lifts develop in height and length, and as skiing fast gains popular impetus, the danger of collision becomes, increasingly, a major hazard of a sport which has otherwise become safer, thanks to the development of safety bindings and approved skiing techniques. The skier who is out of control is not only a boor and a menace to himself, he is a peril to every other skier. You can be standing perfectly still on a slope and have a skier out of control crash into you with disastrous and even fatal results for either or both of you. And bear in mind that two skiers, each traveling thirty miles an hour, making swings in opposite directions, may collide with a combined impact of sixty miles an hour - enough to shatter bones and cause internal injury. So it is not only good etiquette, it is a requirement of safe recreational skiing to forego the crazy, hot-rod thrill of being out of control, to always look where you're going, and to reserve the yelling of "Track!" for those occasions (which should be rare) when emergency requires it. The skier who thinks "Track!" is an imperative directive for everyone else on the slope to keep out of his way may soon be officially banned from the slopes on which he is skiing. (We hope that time will never come, since we feel that skiing, like any other sport, is best served if it is left unregulated in so far as is possible.) It is bad enough to lose lift privileges for improper skiing, but that is as nothing compared to losing one's life or the use of one's limbs. Observing the etiquette of the slope is the best guarantee of safe and happy skiing for you and for everyone else.

If you go touring, never go alone. If, on a tour, a member of your group is hurt, never leave him alone. Send for help at once, and wait for it to arrive. The cost is loss of skiing time, a cheap price to pay for the assurance that your companion will be all right. On the other hand, ski as safely as you can, so that you will never be the cause of lost skiing time for others.

The real skier is a good companion on the way home. He keeps muddy, wet boots off the seats of cars and trains and buses; his equipment has been dried so that it does not form messy pools of water; his belongings are once more neatly assembled and stowed away.

If you are that noble creature, a punctilious skier, you also know that example to others less well trained than yourself is the best teacher for them. Help others to learn, as you yourself know, that there is room and fun for all, if everyone co-operates and shows consideration.

CHAPTER XIII

Competitive Events

One of the wonderful things about skiing is the nature of ski competition. Unlike many other sports, in which direct competition of one person with another is the rule, or in which brute force is the deciding factor, ski competition is always against time, or against distance, and the skill, ingenuity, courage, and intelligence of the skier determine his chances of success.

Ski races are thrilling to watch, esthetically as well as for the excitement of the competition itself.

Watch a slalom race. A course is laid out on a steep slope. Pairs of flags are arranged in various patterns. The skier must ski through each pair. Lots are drawn for order of starting and the race is on. Tight, split-second turns carry the racer down the course; if he misses a gate of flags with part of a ski, or parts of both skis, he is penalized in terms of seconds added to his total time. Here is the race par excellence to test the art of the skier, who is pitted not against a fellow opponent whom he may outfox or outweigh, but against a tricky course and a stop watch. (A typical slalom course is shown in Figure 88. For international competition rules [F.I.S. Rules] write to the National Ski Association of America, 1130 16th Street, Denver, Colorado.)

Or take ski jumping, that glorious and beautiful defiance of gravity. It is not only the distance a man jumps which determines his score; he is rated on form in the descent before the jump, the jump itself, the flight through the air, the landing, the runout. And each point for or against him in his form rating concerns a facet of technique evolved for safe jumping as well as long-distance jumping.

Cross-country racing is less easy on the spectator than slalom and jumping, but it tests to the utmost the all-round skill and stamina of

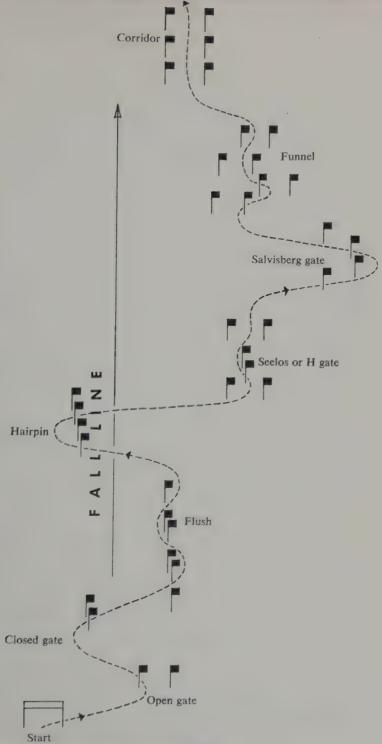


Figure 88 - A TYPICAL SHORT SLALOM COURSE.

the skier, who must go through wood and glen, across streams, up and down trails, over or around obstacles.

And then there's the downhill race, perhaps the most thrilling of them all. In this, the start and the finish line are marked. Usually the start is at the top of a mountain and the finish at the bottom. The course in between is up to the skier. When he leaves the starting line he must select his way down and his manner of descent. He comes to a steilhang (an extremely steep slope, usually bounded by rocks or trees). Will he try to schuss? If he does, will he be able to negotiate the sharp turn at the bottom of the steilhang? Will his legs stand up to the schuss, if he does select it? And the turns. His speed must be under control, his eyes and muscles ready to take advantage of each dip or bump in the terrain, his brain ready to make instant judgments.

And there are combination races which are the true tests of all-round expertness.

But there is another kind of competition you will be interested in. It is for you. At every ski resort there are class competitions in which you can test your skill and your mettle against time. The spirit of the contestants is serious but never grim; the spectators, if any, cheer for all, and when you've won the bronze pin, or the silver ski, or the lapel button or shoulder patch which tells the world that you made a specific run within a certain time, or maybe some token that shows you did better than anyone else that year, then you know a glow and a thrill and a pleasure which are hard to describe. And how hard and willingly you'll work to do better next time!

Conditioning Exercises for Skiers

Ski experts and physical instructors are unanimously agreed that skiing accidents are, in the large majority of instances, the direct result of poor muscular condition. This is quite apart from muscular strength. Plenty of people who are not unusually strong ski well, but they are at their best, and they are safest, when what muscle they have is in good condition.

The first requisite for safe and happy skiing is good general physical condition. Plenty of sleep, sunshine, exercise, good food, and all the other things we all know are milestones on the road to health, are fine for the skier or would-be skier. But most of us lead lives which make the taking of regular exercise, and the following of a healthy day-to-day routine, difficult to come by. And even those lucky — or persevering — few who do keep themselves in fine physical condition are not specifically conditioned to skiing.

The bane of the weekend skier is the second day on the slope, when sore muscles won't respond as they did the day before. The bane of all skiers is the first time out in a season, when the body won't respond to the orders it receives from the brain and nerve centers. The following exercises are designed especially and specifically to exercise those muscles most called upon in skiing, and to exercise them in such a way that they will be conditioned to the special stresses and strains which skiing imposes on them.

These exercises are not to be done to excess. They are time savers in that doing each one a few times will give you the equivalent exercise that doing most exercises fifty times would. However, overdoing them even a little can make you stiff and postpone your getting into shape.

It is advisable to make a chart for the week before your first ski trip of the season, listing the exercises vertically and the days of the week horizontally and checking off how many times you do each exercise. Progress will be pleasingly rapid, and seeing the results will stimulate you to keep at it. Do each exercise until you feel the muscles involved becoming quite tired, or until the breath is short — never more. After each exercise, do "the relaxer." Then write down the number of times you did the exercise and proceed to the next. A half hour should take you through the list. Do the exercises in the order shown, so that your legs, for instance, will have a respite while you do arm exercises, and vice versa. You should work up a slight perspiration toward the end of the half hour and should then have a warm bath or shower. Do the exercises barefoot, in loose clothing, outdoors or, if indoors, with open windows.

Before you start out, though, realize that we are not urging on you the drudgery of muscle building. You are preparing for skiing, not weight lifting. Exercising of the kind described here can prevent accidents because the body will be made more limber and the muscles toned. Tendons will be restored to the desired elasticity. But remember that timing and fluency are far more meaningful in skiing than mere muscle, and don't wear yourself out with exercising. (This is going to cause recriminations and unhappiness in the muscle-building ranks, but it's our advice to you.)

Finally, before you launch into a dreary regimen of self-discipline, bear in mind that skiing is fun and that preparation for it should be, too. A very good pre-skiing means for limbering and conditioning body (and spirit) is to go out dancing. Have fun and dance with all the grace and abandon you can muster. This is said in all seriousness; a good dancer can frequently learn to ski quite nicely in less than a week — whereas many muscular athletes never master skiing.

So, do the exercises as here prescribed — but take it easy! And if you can, do them to music, and rhythmically, as a skier should.

THE RELAXER

To be done after each of the exercises. Stand loose and at ease. Lean against the wall with the left hand and lift the right leg slightly from

the floor. Now flutter that leg, letting the foot dangle at the ankle and keeping the knee joint free and relaxed. Reverse position and flutter the left leg. Stand at ease again, then let upper body hang forward from the hips. Let it hang 'way down, limply. Let the arms fall as they will, shoulders, elbows, and wrists completely relaxed. Hang the head 'way down, let your neck go "soft," be slack-jawed, droop the eyelids, drool, if you feel like it. The entire upper body should be utterly limp. Now, from the hips, sway from side to side, like a pendulum, very little at first, then in wider and wider arcs, remembering to stay sloppily relaxed. A minute of this will rest and refresh you.

CHAIR RAISER

Stand erect, facing the back of a kitchen or ladder-back chair. Grasp the uprights of the back, one in each hand, about halfway up from the seat. With stiff arms and wrists, raise chair forward and up, above shoulder height. Pause, then lower chair slowly. Start up motion again before chair legs come to rest on floor. You should be able to do this three or four times on the first try, unless you're badly out of condition, and work up to five times in three sessions. Once you can do it with some ease five times, move hands higher up from the seat when grasping the uprights, until you can hold the uprights at their extremities.

HEAD TO KNEE

Select a firm piece of furniture the top of which is several inches higher than your hip. Face it, then swing one leg up so that your heel rests on the piece of furniture. Both knees should be locked straight. Place folded hands behind head and bend forward, trying to bring the forehead against the knee of the raised leg. Help the bend by pushing the head with the hands. Push as far as you can with the count of "one," then straighten and rest for a moment, then try again to the count of "two," etc. Start the first day with two tries, lasting a few moments each, and work up to five. Few adults are limber enough to get head and knee in actual contact, but you can get closer to it by the daily five.

PUSH-PULL CIRCLES

Sit erect in a straight chair, arms extended straight in front of you. Make fists. Put the right fist on top of the left fist, pushing one against the other, and then swing the locked fists in clockwise circles, making the circles as large as you can without bending either arm. As you swing your arms thus, raise them gradually, until your locked fists are describing circles over your head. Make ten clockwise circles in this way, then ten counterclockwise; then put left fist on top of the right fist and make the twenty circles again. The total of forty is your aim; if you find this exercise too tiring, start with fewer circles and work up.

HALF KICK TURN CROUCH

Stand with hands on hips, erect, and with the heel of one foot to the toe of the other. This is the position halfway through the kick turn. Now, keeping back straight, bend down as far as you can, hold it a moment, then rise slowly. Five of these is a good starting number. You should work up to twenty within a few days.

WALL WALKING

Pace off three foot lengths from a wall, stand on the spot with your back to the wall, hands down at sides and palms facing wall. Reach back and let yourself fall back until palms touch wall, then slowly flex arms until your back touches the wall. Now push upright again, fall back again, push up again, and so on, aiming for twenty pushes as your regular daily stint. Keep the knees straight and the feet together. To vary this exercise, try "walking" up and down the wall with your hands supporting the weight of your body as above.

CHAIR STAND

This is by all odds the best and most basic leg exercise for skiers. Stand with your left side against the seat of a solid chair. Place the left foot solidly on the chair. Hold arms out to sides. Now, rise slowly on the left foot, keeping the right leg limber but straight. When you have risen to erect stance on your left foot, pause, then rise onto the toes of the left foot. Right foot is dangling. Hold the pose, then slowly lower again until the right foot reaches floor. Change sides and do exercise with right foot and leg doing the work. It may be necessary to start this exercise with one chair stand on each leg. Try to work up to five with each leg. You may have to make a slight take-off jump with the foot on the floor in order to get started, at first, but eliminate this as quickly as possible, since it diminishes the usefulness of the exercise.

CHAIR RAISER TO SIDE

Get out that ladder-back or kitchen chair again. Stand so that its back is under your right arm. Grasp the lowest rung of the ladder in your hand and, with stiff arm, raise the chair sideways until the arm is just above horizontal. Raise the chair slowly, hold it at the horizontal for a moment, then lower it slowly. Change over and do the same with the left arm.

By now you should be ready to lie down on the bed. Do so, but don't rest; you're in position to do the "Ups." First come the leg ups.

LEG UPS

Lie on your back, arms flung wide, not down at your sides where the hands can help by pushing. Legs are together, extended, knees stiff, toes pointing. Now lift the legs slowly from the hips; lift until your toes are pointing to the ceiling; hold the pose a moment, then let your legs down slowly, slowly, until the feet almost touch the bed again; then up again. Do two ups to each rest. Two is good for the first go at it. You should work up to six in a week.

BODY UPS

Lie on your back, hands on thighs, legs extended. Sit up slowly, letting the head hang back until you're upright, but don't pause there,

Keep going forward, reaching for your toes with your hands. When your fingertips touch your toes (or come as near as you can manage), lie down slowly again. Start with four body ups and work up to ten.

PUSH UPS

Down on the floor, prone. Put the hands, palms down, on either side of your head, each hand about five inches from the head. Keeping the body rigid, neither bowed up nor sway-backed, push up until the arms are at full extension, then lower until face almost touches floor, then up again, etc. Four push ups the first try are good. Work up to ten. If you have to let your body down to rest, give up until the next day — you've done enough for this time.

Now come two important and valuable foot exercises. They will rest you for what's still to come. The first is named after the frightening noises your feet make when you do it. Remember, each crackle you hear is doing you good!

BONE CRUNCHERS

Stand with feet parallel, about three inches apart. Rise all the way up on your toes. Now, "roll" yourself down on the outside edges of your feet, and roll thus all the way back until you are on your heels with your toes up off the floor. Immediately, rise on your toes again and repeat. Spread the knees, so that the roll-down is really on the outside of the foot; get the toes up so high you feel the pull in your calves. Start with ten crunchers and work up to twenty.

BOOK STAND

Put a nice, fat telephone book on the floor, stand with your toes on it, and with your heels on the floor. Stand erect. Now, without leaning the body forward, rise onto your toes, and slowly let yourself down until your heels touch the floor, then up again, and so on for ten times. Work up to twenty.

SKIER'S TOE TOUCH

The it you do heard, to kning the tree without bending the resets. With a new twelf transference, reach for the ceiling, as high as you dot, way, as you heard vack, however stretching up, up, up flow, sweep down two and hard getting your hopers as near to your tree as you can find the preston a number, then tend the knees all the way, and you are strong on your nests, and amultaneously extend your arms up, not as firms of you. Hold the tend while you away your arms up, many the the county again and then rise county all the way up, up once your tree, reacting for the county and then sweep the arms they again, trying to token your tree. Keep it up, in rhythm, not stopping technics accounty. Fire times is a good starter, ten times is good for anyther.

BOOK LIFTER

Ready to be down again? The supplies arms out, spread wide, a fairly steary took in each casic. Read the arms with eleman unitions, oringing the owns: together directly above your face. Lower them slowly, out to use uses again, and unitine your hands town the sed, start raising the arms again. Own with the owns lift, and increase to ten.

SNOWPLOW BENDS

Vand with legs to be a delegant. Turn the tree in as far as they will go from tend the coses toward each other and receptly the upper tody as each as possible strive to get tody paints far to the fixer beams you. You have accused it out strive. Puse slowly and try again. These trees has first time a enough. You mould work up to doing five took beads, whoseit times if you find it easy, you to starting with your legs too close together.

BENT-ARM PUSH PULLS

Sit on a chair, put the fists in position as described under push-pull circles, then bend the arms until fists almost touch the chest. Now make the clockwise and counterclockwise circles again, changing top fist from right hand to left hand, and remembering to keep them pressing each other, so that one fist tries to make the circle while the other resists. Now try the same thing behind you, making the circles as large as possible. There is no "correct" number of times to do this exercise; the harder you make one arm resist the other, the more you get out of each circle.

THIGH STRETCH

Stand erect, feet together and slightly toed in, arms held out at sides for balance. Support the weight on the left leg, without shifting the symmetrical body position. Now bend the left knee, at the same time extending the right leg out to the side, with knee stiff and toeing in with the foot. Bend all the way down, until you are almost sitting on your left heel, your right leg far out to the side. Now shift the weight to the right leg, at the same time bending it while the left leg straightens. When the right leg is fully flexed and the left leg is extended, rise erect again. Bring feet together and repeat the exercise, starting this time with the right leg bending. Three on each side is a good beginning. Aim for five on each side done without strain.

There is your fast daily half hour of ski conditioning exercises. Do them faithfully, and you'll ski better, more safely, and more enjoyably. Much skiing time is lost on the slopes in trying to make unwilling and unready muscles respond to the skier's needs and wishes. These exercises will prepare you to get the most out of your time and can materially accelerate the learning process.

CHAPTER XV

You on a Downhill Run

The following is not, in the direct sense, a chapter of instruction. It is included here so that those interested — and any doubting Thomases — can go through a ski run on paper and see how everything taught in this book is of practical value and of importance to the allround skier. Here, too, you will find hints and reminders, and, we hope, a little of the thrill of skiing.

It's a grand day, clear and cold but not too cold; there is no wind, and you're up early, properly dressed for skiing, breakfasted and (we hope) feeling fine after a good night of sound sleep. So out you come, with your skis over your shoulder, and off you go to the ski slopes.

Today is the day you've been planning for so long, the day you go up to the top of the mountain, higher than the lift will take you — and then down all the way, down the schusses and down the trails, down through the trees and over the open spaces, down, down, down until you come to the final schuss and the end of a marvelous run — you hope. And since we can foresee the future (on this day, anyway) we'll tell you your hopes are going to be realized.

You are at the lift, with your lift ticket punched. Get in line (or are you the first out today?) and when you get to the starting line wait for the chair to come around. Sit as it touches you, grasp the upright, keep your poles clear and your ski tips up. . . . The snowscape unfolds as you ride upward, and soon you approach the top of the lift. Get set, and as the snow comes up under your skis, rise and ski away.

You walk on the level, with fine, reaching, parallel strides, over to the rope tow, which goes even higher than the lift. In line again; poles correctly held, skis parallel, you grasp the rope and with flexed arms taking up the shock of starting you're off and upward bound again. At the top of the tow you let go neatly, ski out of the way of those coming along behind you, step-turn around, and — there, before you, stretched out for miles and miles, going off into incredible distance, you see hills of white.

But the real summit is still above you, so you turn again and start up in good, easy traverses, edging nicely, keeping the body erect, using your poles to help you. As you look down you may feel that instant of panic which makes you want to lean in toward the hill, but you know that's less secure than keeping your body directly above your skis.

Kick turn, toward the slope, of course, and then a traverse in the new direction.

Now you're nearing the top and it's getting a little steeper. Starting your half side steps, you keep forging forward. Now you come to an escarpment, an outcropping of rock which you can skirt, if you wish, but there's a clear path up between two projections of rock, and although it's too narrow for your half side step or traverses, you can make it with the herringbone step.

Pretty tiring, wasn't it? But you don't want to pause, so you proceed up the last few yards with the full side step and now, well, who can describe the sensation of being at the very top of a mountain, with the view unfolded all around you, and the sky stretching blue and limit-less above?

While you rest from your climb, you look down and plan your course. Ready? First, adjust the bindings on your skis. For the climb, the cable was in the first side clips. For the trip down you hook it under both clips, getting full downpull on the heels. Bootlaces good and tight? Cap on firmly enough so it won't blow off? Poles held correctly?

You move along your level space at the top until your ski tips hang over the lip, pointing into thin air. You flex your knees, your heart beats faster, you tense for the take-off — and then you give yourself a little lecture: "Take it easy, don't be tense, good springy skiing is what we want."

And then you're off, in a schuss which gathers speed as you go, so that when you come to the path where you did your herringbone, you flash between the rocks.

The rocks behind you, you find you're going mighty fast and heading for a clump of trees. Off to the left, there's more clear slope. A fast stem christie swings you into a traverse. Now you're angling down,

skis parallel, standing easily and comfortably on your skis, but alertly, and with your skis equally edged and close together.

As you approach the open slope, you can see more and more of it. Hmm, seems pretty steep. Better have a good look at the whole expanse before attempting it. Another stem christie, sharper than the first, slows you down some, and then you wind up and execute, by gum, a perfect stop christie.

Mighty steep slope we're looking down, you and we over your shoulder. You wonder what's around the clump of pines on the edge of the slope, halfway down. Can't quite see around them, and you don't want to ski down slowly for a look, because that would be wasting a fine schuss. How about risking a schuss anyway? Not you; you're a safe and sensible skier.

So you sideslip down the steep start of the slope for a bit, and then edge to a stop. Going straight down those few feet gives you the view you want — there's a wide trail leading off at an angle from the slope, through a patch of woods. Looks interesting.

You get set to go down the open slope. You figure three wide swings will serve the double purpose of controlling your speed and heading you into the trail on the last traverse.

Off you go, traverses linked with stem christies, and a feeling of flying making you smile as you ride. And then you whiz onto the trail and — oops! — there's a bare stump, right in front of you. A quick, neat pole christie, and you're around it safely, and high-balling along.

Now you see that the trail seems to come to an abrupt end up ahead. Looks like pretty thick woods there. A tight, deft stop christie, with good counterswing and sharp lift and swing, brings you to a stop. And now you snowplow forward, slowly, scanning the trail ahead. Trees, trees, trees. What have you got yourself into? Are you going to have to backtrack uphill and seek another way down? You press down the heels of your skis, bringing your plow very nearly to a stop — and then you notice that the trail, which looked as if it were at an end, makes an abrupt turn downhill.

Lucky, what? So you let your plow run together a little, but not all the way, since the trail has narrowed too much to permit linking turns to keep your speed down. Then a snowplow turn around the sharp bend in the trail, and you see a winding, narrow pathway through the trees, going almost straight down. You don't know what you may encounter around each corner, so you hold your snowplow to keep down

speed, and you use the reliable old snowplow turn to make your way downward.

The trees get sparser. Off to the right you see that they're petering out at the edge of another open slope. Now you let your plow run together, and before you get up speed you do a stem turn into a traverse toward the open. And then, traversing for a bit, you come to the last few trees, and by now you have enough speed to swing in and out of them, as if you were running a slalom, except that it's easier, and slower, and you're using stem christies.

Here you are, out of the woods, and dropping away below you is a rolling open slope, which gets steeper as it goes. It ends in a level runout, and after the runout there is a slight rise. You feel like letting out a whoop as you stem-christie into the fall line and let 'er rip. The skis pick up speed, and you're right with them, poised squarely over them, knees flexing to take up the bumps in the terrain.

Faster! And faster! The strain on leg and ankle is perceptible now as you schuss down and down, the wind singing in your ears, the skis roaring over the untracked powder snow. Now, while you still can, you start a series of long-radius parallel swings, tempo turns, crossing back and forth over the fall line, staying close to it, keeping you at uniform speed and giving you the knowledge that you're definitely Superman, at least. At your high speed and on this powder snow, the long swings are easy, and the rhythm of them and the plume of snow that accompanies you like the bow wave of a ship makes us, who are looking over your shoulder, very proud indeed.

As you approach the bottom of the slope, you point the tips straight down again for a final schuss, and then you flash out onto the level and sail across it, and even, at diminishing speed, up the rise beyond it, using a snowplow to come to a full stop on the ridge at its end. Good thing, too, because if you'd been reckless and let yourself go on over the hump without looking, you would have cracked up on an outcropping of rock. Being a good skier, you look before you leap.

Now, looking down a way you see the regular open slope served by the ski lift, off to your left. You see, too, that a knoll which you passed on your way down offers, from its top, a good way to get to the slope, and you decide to climb it.

Two uphill traverses and a tough, short stint of herringboning bring you to the summit of the knoll, and there's a trough-shaped trail running down through the trees to the slope you're heading for. You swing

down the easy way, for the shape of the trail, with its upcurving sides, slows you on each traverse as you approach the bordering trees and makes a stem christie the simplest of matters — and then you traverse down and across the trail again and up the curve of the other side, and another stem christie starts you across again.

As you near the opening to the slope you schuss down the center of the trail, and then you see ahead of you a patch of rutted, pitted snow, which melted in yesterday's afternoon sun and has since frozen somewhat. You set yourself to ski across it, but as you start you notice a set of slalom flags directly below. It would be fun to run through the gates, you decide, and you want to turn. The rutted snow would make turning hard if it weren't for your skillful pole christie which gives you the tripod action you need for a secure turn under these circumstances.

As you approach the slalom course, you get set and then attempt the supreme test of skill and timing — tight turns and fast pole work as you go through the gates and flushes, every muscle straining to keep speed and yet cross between the pairs of flags.

Well, too bad, you missed one, didn't you? But the foot of the slope is in sight and you spy some friends standing there. A final schuss, and as you approach them you let yourself come nearer and nearer, at full speed. A stop christie with a good plume of snow, right in front of them. That should impress them.

Hmm. How in heaven's name did you happen to fall? Of course, you know better than to show off by trying to scare people, but it would have been fun. Well, next time, you decide, you won't be quite so fancy. Anyway, you know how to get up!

So up you get, grin sheepishly, and head for the lift again. One more run is what you're after; it's still early enough, and you haven't had your fill. But this time, you decide, you'll just ski the regular terrain, instead of going off on your own to virgin snow. Which means moguls!

Are you defeated? Not you. You start out on a traverse, bumpy but shallow enough to let you do a bit of planning ahead. You are skiing with good elasticity; your poles are held forward at the ready for stabilizing action, timing, and short swinging. When you find a convenient mogul of just the right size, you ride up it, use its crown to give you lift, use your pole and make a stem christie into the groove.

Coming out of that groove you've picked up speed. You're closer to the fall line, too. A few parallel turns with poles are now in order. Using the terrain for lift and banking on the walls of grooves, it's easy.

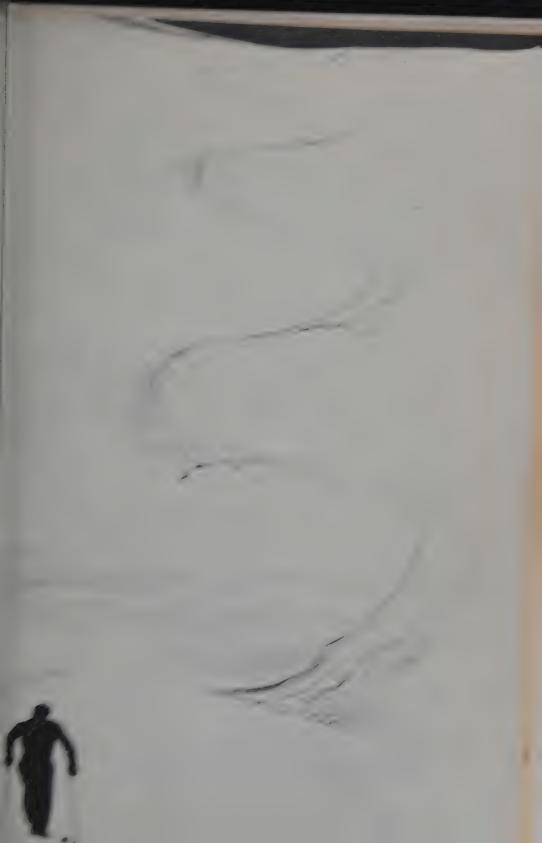
Ahead, you see three moguls which are quite steep and close together. You have the speed and the control to use the first for the take-off of an airplane turn — and you land neatly in the groove on the downhill side of the third. As it widens, momentarily, you check a bit with a fast wedeln while you look ahead. Looks good — bumpy but negotiable close to the fall line, thanks to your wedeln technique. So it's wedeln through the rest of the moguls. Then you see that you're approaching a steep drop-off. You can avoid it, but why should you? Gauging your speed and distance, you prejump and are airborne well before you cross its lip — with the result that you land smoothly and gracefully.

The rest of the run is easy. A comfortable schuss with a bit of wedeln for control, for fun, and for — well, for the hell of it. Why not — it's been a hell of a fine day! You're just sorry it's over.

It was a marvelous run, though, wasn't it? You take off your skis, wipe them dry, put the running surfaces together and lay them over your shoulder. Walking to the inn, you feel the joy of accomplishment and the physical glow of muscles well tried and now relaxed.

And that night, do you boast of your run? Do you drink yourself tipsy? Do you stay up late and devote yourself to the building of a beautiful hangover?

Not you — we hope. Early to bed, because tomorrow's another day and bigger and better mountains beckon.



Final Thoughts on Schools of Skiing and the Dynamics of the Art

In this book we have repeatedly attempted to make clear our belief that the method of skiing expounded in its pages is scientifically accurate, logical, effective and sound. We have purposely avoided criticizing any other specific method. We have gone out of our way to state that individual skiers have developed their own individual styles and techniques which are immensely effective for them and which can be learned by others — though we've maintained that this is an approach to learning that is unpredictable in outcome. On the other hand, in fairness to the recreational skier, we have pointed out that there exist schools of teaching which develop skiers of sadly limited resources, people who can ski very adequately on packed and smooth slopes but who are defeated by deep snow and rough terrain. These are the people who find themselves helpless in situations approximating Alpine conditions. Not only are they defeated, but they are cheated of the ultimate joy of skiing, which is skiing in the mountains, not on prepared slopes. All this we have stated in one way or another several times throughout this book. Now we must go a step further.

Let us first talk sensibly and without prejudice about reverse shoulder action, recently enjoying a considerable vogue.

Forget about skiing for a moment and think instead about driving a car. Have you ever driven on a sandy road or a dirt road and approached a turn so fast and oversteered at the beginning of the turn so much that the rear wheels skidded out as if from under you, centrifugally? Or have you ever driven on an icy road and had the rear wheels skid out on a turn? If so, you know that the correct way to compensate for the skid, that is, the correct way to get the wheels back under the car (so to speak) is to steer in the direction of the skid, not

away from it. Thus, if in your car you are making a right turn and the rear wheels skid out to the left, you will wind the steering wheel to the left to straighten out the car and establish traction between the wheels and the road again. Bear that in mind and now think about skis and skiing. Think about a skier who enters a turn and has the tails of his skis skid beyond the desired degree necessary to carve the turn. What can he do to get the skis back under him and to convert the skid into a turn? The only compensatory movement possible for him is reverse shoulder action. In fact, it is possible to evolve a technique of skiing which is built on what in an automobile would be considered oversteering; that is, the turn is initiated very hard with a lot of skidding of the heels of the skis, and reverse shoulder action is employed to compensate for the overskidding. Put more simply and directly, if it were not for overskidding, the reverse shoulder action would constitute overcompensating.

This may sound like a harsh judgment upon reverse-shoulder-action proponents. But consider the analogy of the automobile. Or, rather, try to think of skiing and of car driving simultaneously — and then you can grasp the fact that direct shoulder action approximates the movements of shoulders, elbows and hands in steering a car. When you put your car into a right turn, it is your left arm, elbow, hand that go forward. When you are driving straight, your shoulders are at right angles to the direction of your motion. When you are turning left, it is your right arm and hand that go forward. Similarly, with correct, controlled skiing, the movements of the skier's body are such that he remains directly, firmly and controlledly over his skis — and does not let them leave him behind or slide out from under him sideways.* This may happen. It may be that in negotiating a tricky slope or a tricky slalom course the skier will have to contort his body and resort to compensations and overcompensations in the interest of achieving his goal of speed and more speed. (Parenthetically, it may be interesting

^{*} The exact synchronization of all body and ski motions is a critical concern for the elite skier. Specifically, he is faced with the problem of synchronizing body motion with the very rapid arcing of the tails of his skis, in order to be "with" and "above" them at all times. This is not always possible; it happens from time to time that the leg motion outpaces the motion of the upper body, timing is lost, and reverse (delayed) shoulder action results. Top skiers who find their timing is off in this way will usually slow down the arcing of their skis a bit until they get back into correct timing — thus regaining the much-needed stability which only correct timing affords.

to speculate here on why, if what we say is true, so many pictures of expert skiers seem to show them in positions and postures other than those we prescribe as correct. The answer is not far to seek: These make the most interesting, unusual and exciting photographs, and photographers are in the business of selling pictures, not teaching skiing. But to use these spectacular and enjoyable pictures as models is not the road to controlled skiing.)

On these pages you have seen photographs of Anderl Molterer and one of your co-authors, Fred Iselin, skiing at high speed. A robot camera was used to catch them and "stop" them for clear photographs of body, arm, leg and ski positions. We believe that these pictures are notable for the complete absence of reverse-shoulder skiing. Perhaps a more tellingly persuasive comment than that provided by these pictures is what has been observed of the technique, during slalom competition, of Toni Sailer, skiing's only three-time Olympic champion. National Skiing (the skier's "newspaper") had this to say about it, in its January 1, 1958, national edition: "Sailer has adopted a principle that used to be current in racing circles, but was edged out by the inside-shoulder antics of such great skiers as Stein Eriksen. That is, the upper body and hands must lead the feet in slalom." In its comments on the pictures which accompany the quoted article, National Skiing says: "These photos reveal that Sailer . . . skis in competition in what is a conservative manner," and goes on to urge young racers to "concentrate on the skiing fundamentals that have made Toni great."

The trend to wedeln — which has become a virtual fad — has done much to advance the cause of reverse shoulder action. Let us now say something about that.

As we have pointed out, there are two distinct forms of wedeln: wedeln with a purpose, and wedeln for fun — which has no value in terms of technique. About the latter, we need say nothing; if you enjoy it, more power to you. About wedeln with a purpose, Iselin speaks as follows: "During the past two seasons we had the pleasure of watching international skiers of the highest caliber skiing in Aspen. Included were Toni Sailer, Anderl Molterer, Josl Rieder and Roger Staub. These men were observed closely, not only training for races and in actual slalom and downhill racing, but skiing among themselves on Aspen Mountain for fun. While skiing among themselves, reverse shoulder action was virtually unseen. These men ski with great grace, elasticity, and power — and in every turn and motion it was always the 'outside

hand' that led the maneuver. Even the highest-speed short swings revealed a hint of rotation — and how else could it be? How can a skier have the forward aspect of the body and the intensely rapid action of poles in wedeln with reverse shoulder action? The bumpier the terrain, the steeper the slopes, the rougher the conditions and the closer to the fall line the skiers went, the more apparent this became."

Again, we are reminded of that German word wendig. This is the mark of the great skier: maneuverability, elasticity, fluidity, grace and power. And here may we say that these are exactly the qualities that the step-by-step technique proposed in this book will yield to the man or woman who has the will and the courage to become expert.

You may ask: Why, then, is reverse shoulder action so universally considered a part of wedeln? A good and a logical question which we will now attempt to answer.

A major ingredient of the answer depends on our referring to the purposeless wedeln, the so-called "mambo wedeln." This "mambo wedeln" has received considerably more attention (as of now) than one might suppose could be accorded a useless though pleasant maneuver. Since reverse shoulder action is part of this dance on skis, the public has come to think of wedeln and reverse shoulder action as inseparable. The reverse shoulder action, with the inside shoulder leading the turn, puts the upper part of the skier's body a half-beat behind the skis. On easy terrain this is fun and the resulting syncopation looks quite spectacular.

Let's now consider skiing from another point of view: the skier's aim in perfection of his technique and his personal feelings while skiing — one might even say the aesthetics of the art. The greatest sensation in skiing is the feeling of floating. To be light, to feel airborne, to swoop and glide — these are the exhilarating thrills of the sport. Floating turns, effortless and light in any kind of snow or terrain, are the ultimate goal of the skier. Obviously, the racing skier, like the race-track jockey, is more concerned with getting to the finish line than with happy, comfortable, expert movement. But just as the recreational rider does not ride with short stirrups, his rear end up in the air and his body extended out over the neck of the horse, the recreational skier does not find himself in the momentarily distorted positions that the racing skier must occasionally assume. One of the major differences between skiing and horseback riding, however, is that despite minor

variations, the fundamental dynamics of ski racing and recreational skiing are the same. Thus, in any kind of skiing, it is the entire body—elastic and in conformity—which creates the expert maneuver. Turns and maneuvers can be made with legs alone, and feet alone, and by slinging the hips from side to side. These, however, have nothing to do with the essence of fine skiing. The technique of today's superb skiers is compounded of elasticity and timing. These, in turn, require rapid reflexes and a sense of lightness. There do exist strong men who can "force" a turn. This is not the kind of skiing we are talking about or the kind that is the skier's ideal.

Quoting Iselin again: "Every year the Aspen Ski School invites outstanding skiers to be its guests so that their technique may be observed by the school's staff. This is how we were able, as mentioned above, to observe Sailer, Molterer, Staub, Werner, Dodge and Rieder, probably the outstanding international skiers today — and for some time to come. Although each has his individual stylistic differences from the others, they were identical in the fact that they skied extremely lightly, with great elasticity and with the 'normal' technique as we have been expounding; that is, limited rotation is still visible in high-speed turns, and the skier's body is above and with the skis. From observing them we can learn an additional important lesson, which is that it is not necessary to be extremely muscular in order to be a powerful skier. The power comes from technique, not from brute force."

These are not brand-new discoveries. In the thirties there was a great fad for what was then called the "jerked christiania technique." It involved reverse shoulder action and an abnormal amount of legwork. It developed "hard" skiing, rather than light and floating skiing. The turns were "pressed" and "cramped," and they looked artificial rather than easy and fluent. The turns were sideslipped instead of being carved. Since the uphill shoulder was leading all the maneuvers, the skier had a tendency to "hang" on the uphill ski — which subjected him to the danger of catching the inside edges. This technique was soon abandoned in favor of more normal skiing. It was a good try and an interesting try and, like all experimentation, whether successful or unsuccessful, it helped to clarify the dynamics of skiing.

It is a wholesome and adventurous thing to have skiers constantly seeking improvements in the art and to have instructors constantly seeking improvements in the teaching of technique, with the aim of making the learning process quicker and easier. Older readers will recall, perhaps, the vogue for learning parallel skiing from the very beginning. In this system the turns were not initiated with lift to get lightness, but lightness was achieved by an abrupt forward dropping of the body which pressed the ski tips in a "digging" motion and robbed the sport of the wonderful floating feeling because the turns were hard and harsh rather than gliding. This instructional method had its adherents and its fans for a time. But since it proved to have more drawbacks than advantages, and since it was not suitable for deep snow or rough terrain, it was largely abandoned.

Certainly there are occasions when any maneuver which will accomplish its intended purpose is legitimate. An international racer going down a tricky slalom course will frequently be photographed with his inside shoulder leading a turn. Usually this occurs when he's going through a hairpin combination or entering a flush or gate where he must "shave" very closely. But for recreational skiing, for "fun" skiing — even by champions — the occasional expedients resorted to in racing are abandoned in favor of normal, elastic, gliding skiing.

Perhaps the best final word on this controversial subject of schools of skiing is to risk repeating that we are firm believers in experimentation and healthy controversy; we believe that from these comes progress. In every technique there are virtues which have contributed to the evolution of modern skiing. For instance, the light ruade, which Seelos introduced years ago, was adopted by the parallel technique; the legfanning wedeln or short swing has been incorporated into virtually every school of skiing. But these desirable additions and variations have not changed the basic principles of skiing nor do they seem likely to do so. On the other hand, it would be a sad thing indeed for skiing if people like, for example, Friedl Pfeifer, who so ably heads the Aspen instructional staff — one of the largest in the world, were not constantly on the lookout for possible improvements. Happily, the opposite is the case: Everything new that comes along, everything that purports to be new, is closely scanned, is tried, is experimented with and debated — on the slopes and later in meetings that sometimes go on and on for hours. A rigid attitude toward ski techniques is as fatal to the interests of skiing as a rigid aspect of the body is to the skier on the slope. Change is a wonderful thing. However, we might close by quoting the old French proverb: Plus ça change, plus c'est la même chose.

APPENDICES

A: SKI AMERICA

In less than a dozen years, America has outstripped Europe as a site for recreational skiing. This may sound like the rankest chauvinism; it is not. Furthermore, the statement is true in several respects. First of all, it can be authoritatively stated that the general level of skill and technique among American recreational skiers is far higher than is to be found in any country in Europe. Second, the physical ski conditions of the American West and Northwest often surpass those to be found even in Switzerland. It is a matter of record that international recreational skiers, as well as competitive skiers for whom money is not a necessary consideration prefer skiing in the mountains of Utah, Colorado, Idaho, Nevada, California, and the Pacific Northwest to skiing in most of the European terrain. On the third and final level, America is superior in equipment — lifts, tows, resort facilities, parking areas, etc.

America's major drawback — and one about which we can do nothing, but obviously need feel no shame — is its size. It is no small thing for a New Yorker to decide he wants to ski on Mount Hood; in flying time and air fare alone, this becomes a major undertaking. By comparison, a Frenchman could ski in Switzerland on a fairly comfortable and convenient weekend. Furthermore, once within Switzerland, he would have his choice of a great many resort villages all within easy touring distance of each other. The American who goes to Sun Valley is there, period. If he wants to go to Alta or Shasta or Aspen, a rather extensive rearrangement of his gear, his plans and his pocketbook is involved.

On the other hand, certain areas of the United States, and certain states, are building new areas and resorts at such a great clip that it may soon be possible to tour from resort to resort without too much intervening wild country—a doubtful advantage, especially in the eyes of those who love touring untracked mountains, but one which a great many Americans (as a nation, we seem to have a morbid dread of climbing under our own power) will cheer and applaud.

For people who like statistics along with their facts, Ski Magazine, which has been conducting an annual national survey among its readers, reports that there are approximately one hundred and seventy ski areas in the United States, one in Alaska, and twenty-four in Canada. These figures, they tell us, refer to ski areas which have a minimum of one lift. Areas which have nothing more than a rope tow or tows are not included in this count. However, an estimate of rope-tow areas would put the total at over one thousand. The magazine goes on to state, in a personal letter to your authors, that there is no way at the moment of estimating the total number of recreational skiers in the United States, partly because as yet there is no clear-cut definition of what a skier may be. Thus, the magazine's publisher estimates that there are probably a million people who could be classified as truly active skiers; using a much more lenient and looser definition of the word "skier," the figure is probably upward of three and a half million, with growth estimated at over 10 per cent per year.

While speaking of *Ski Magazine*, we'd like to urge all skiers to browse among the various ski magazines published in the United States (and, for timely news and pictures, the monthly periodical, *National Skiing*); we know of no way the recreational sportsman can get more of the feel of an activity — and some of its excitement and esprit — than through the words, pictures and advertisements which appear in periodicals dedicated to a particular sport. Finally, an indication of the physical growth of the sport may be gleaned from the fact that in its November 1956 and November 1957 issues, *Ski Magazine* was able to list in each year about one hundred new lifts under construction, including double-chair, poma, T-bar, platter-pull, Austrian *Sitzlift* and gondola types.

Just as ski areas and resorts, and lift facilities, are multiplying, so too are the special means of transport for the recreational skier. Many air lines, railroads and buses that serve areas of the country where there is skiing run special trips for skiers at special "package" rates. There is hardly a large metropolitan area in the entire country which does not have, during the ski season, some carriers devoting special attention to the skiers' needs in transportation.

What with this public transport and the fact that snow-blessed states — conscious of the value of the ski trade — are doing more and more in highway development, maintenance, and clearance, it is far easier physically to get to skiing now than it has ever been before. And the trend is not only continuing, it is accelerating.

If you want to try skiing the West — the Rockies, the Sierras, the Grand Tetons, Wasatch, or Jackson Hole country — you can get rapid and good transportation and quick information about it from the Union Pacific Railroad, Northwest Airlines, and United Airlines.

Plane or train, the West is a wonderful place to ski. Good powder snow, open slopes without trees or rocks to obstruct the way, numerous lifts, a long skiing season — and the justly famous friendly courtesy of the Westerners.

The budget skier will do well, in planning his ski trips, to investigate skiing in our national parks. Among those which have fine ski facilities and slopes are Jackson Hole, Rocky Mountain National Park, and Yosemite. These parks have been preserved for public use; you will not find swank accommodations or phony display, but if you want to ski over some of the finest terrain in the hemisphere, live satisfactorily but not too expensively, sleep at night instead of carousing, then the parks are the answer to your dreams of winter fun.

Colorado is one of the outstanding ski states in the West. Trains leave from Denver regularly for some of the best skiing in the world, within easy reach. Bus service is available.

The Pacific Northwest is a skier's paradise. Huge, fine areas, like the Snoqualmie Ski Bowl, near Seattle, are serving thousands of ski fans and have room for thousands more. In the Northwest, in regions like those around Mt. Hood and Mt. Rainier, there are fine facilities and finer ones are in the planning stage. The skiing in the Canadian Northwest, around Banff and Jasper, would require a whole book to tell about.

Montana and Wyoming, too, are becoming ski conscious. Dude ranches which used to close for the winter are staying open for winter sportsmen, tows and lifts are being installed all over both states. The Northern Pacific, Great Northern, and Milwaukee railroads serve these areas and will supply you with information. The same holds for Northwest Airlines.

If you plan to ski in the West for the first time, you can learn — and you should take the trouble to — about the many places and accom-

modations which cater to the skiing public before you decide where and when to go and how to get there. The best procedure is to consult accredited travel agents, the railroads or plane lines serving the region you're interested in, and chambers of commerce, both state and local.

The Midwest, too, is getting into the skiing picture. Michigan and Wisconsin lead the way so far. Boyne Mountain, in Michigan, provides fine skiing and a resort with heated outdoor pool. Ishpeming has long been a Midwest skier's haven; Iron Mountain is one of the oldest sites of ski-jumping competition.

Skiing in the East has its thousands of devotees, and it isn't always a case of their selecting the nearest place to get to. The excitement of trail skiing, the peculiar and unique charm of New England villages and French Canadian hamlets, the excellent accommodations which are available, all contribute to give Eastern skiing its own special advantages. Maine, New Hampshire, Vermont, Massachusetts, New York, Pennsylvania — all these states are literally dotted with ski areas ranging from a goodly hill with one rope tow to a highly developed mountain resort offering lifts or trams and a choice of many trails or open slopes down from the summit. The New York Central, Boston and Maine, Boston and Albany, Pennsylvania, New York, New Haven and Hartford, Canadian Pacific, and Canadian National railroads and Eastern, American, and many other plane lines serve the New England ski areas, the Laurentians, and other Canadian and American Eastern winter resorts.

Once again, you are urged to find out in advance from transportation companies, travel agents, and chambers of commerce just what kind of skiing and what kind and price of accommodations will be found in a specific place, *before* making up your mind.

One of the major considerations should be the type and cost of instruction available. As has been said before in this book, there is no substitute for sound on-the-snow instruction from a qualified teacher. So once you determine, in general, where you'll go and when, find out from specific areas or resorts what the teaching facilities are.

Looking into the future — a future of jet planes and large transports — can be a delightful occupation for every skier who wants to plan a dream itinerary. Switzerland, the Tyrol, the Alps, the Dolomites — names to make a skier's mouth water. And skiing in our midsummer in the Chilean lake district! But meanwhile, most recreational

skiers want a convenient, inexpensive and pleasant place to go on weekends. And the demand will create the supply, a better supply than already exists, and soon.

Today the prospect looks splendid for American skiing. Tomorrow it will be even better.

B: THE NATIONAL SKI PATROL SYSTEM

If you are feeling glum about human nature, or gloomy about the selfishness of man, take cheer by giving a thought to the National Ski Patrol System.

The N.S.P.S. is an altruistic, volunteer, and extremely valuable organization devoted to helping you to enjoy yourself on skis. Its services are free, its members are the cream of the skiing fraternity, and even if you've never seen an N.S.P.S. man or team in action, you've benefited from their existence once you've been on a ski slope.

Less than twenty years ago, the National Ski Association of America set out on its program to build the Ski Patrol. The idea was to have an organization of skiers qualified in first aid who would devote time to special ski training, to patrolling ski areas with the principal aim of preventing accidents and the important additional aim of aiding those who were injured. At the time, it seemed to some pessimists that to expect success without offering patrolmen an earthly reward was to assume too much concern on their part for their fate in the hereafter. "Will there be skiers," these doubting Thomases asked, "who will give precious skiing time to helping total strangers?" The answer is now known; there are good samaritans of skiing who have proved their selfless devotion to the sport.

In the years since its founding, the Ski Patrol has organized literally hundreds of patrols, operating all over the country, wherever skiers gather. It has collated and disseminated information on the best methods of dealing with the peculiarities of ski accidents. It has saved an incalculable number of lives, thanks to preventive and precautionary action; it has aided and transported to medical attention thousands of hurt skiers. (Don't worry, the accident rate of skiing is still lower that that of most other sports.) The patrols equip themselves, at their own expense, with rescue toboggans, blankets, splints, first-aid equipment, and every other article necessary. There is only one qualification

for receiving help from a Ski Patrol man or woman: the need of it. Here, in ten major points, is what the N.S.P.S. does:

- 1. Provides a supervised, active, nationwide service of trained and equipped personnel.
- 2. Publishes a manual for the instruction and co-ordination of patrol work on a national scale.
- 3. Assists in activating new patrols wherever needed.
- 4. Assists in maintaining first-aid-equipped toboggans and medical supplies in all localities where it operates.
- 5. Co-operates with local authorities in improvement of trails and slopes and intelligent use of trail markers.
- 6. Skis all trails and slopes at the day's end to make sure that all skiers are safely off the mountains by nightfall. Organizes search patrols if any skiers are reported missing.
- 7. Sponsors a medical committee to study accidents in aggregate and draw conclusions for future preventive measures.
- 8. Sets an example of safe and sane skiing.
- 9. Works twelve months of the year to develop and improve its own activities.
- 10. Maintains a national office for the efficient supervision of all patrol activities throughout the country and the dissemination of any and all relevant information.

The N.S.P.S. is supported by membership dues and by contributions. If you want to join — and you should — you can find out all about it by writing to the N.S.P.S., 415 Lexington Avenue, New York 17, New York.

C: GLOSSARY OF SKIING TERMS AND PHRASES

Being an alphabetical listing of those words and expressions most commonly used by skiers.

ABSTEMMEN. Counterswing; the windup which precedes a turn. Refers specifically to pulling back of uphill shoulder and stemming of downhill ski, with accompanying shifts in weight.

ALLAIS. Emile Allais, famous French skier, has had his name attached to various articles of ski equipment, as Allais boots, Allais goggles, etc.

ARLBERG. St. Anton am Arlberg, Austria, home of Hannes Schneider, father of modern skiing; hence Arlberg Method, etc.

Base Lacquer. A hard, tough lacquer applied to the running surfaces of skis in order to protect them from wear and wetness. Waxes go over the lacquer, or it can be skied on without wax covering, on average snow.

BASE SNOW. Old, settled snow which lies beneath fresher falls.

Base Wax. Previous to the perfecting of lacquers, a base wax was burned into the running surfaces of skis. A few skiers still prefer base waxes to base lacquers. They serve the same purpose.

BATHTUB. Often called Sitzmark (the Austrian term). It is the embarrassing hole in the snow which results from sitting down hard, usually the outcome of rücklage. Good skiers fill up bathtubs and smooth the snow before going on, out of consideration for the next man, who can have a nasty spill if his skis dip into a bathtub and plow below the surface.

Breakable Crust (or Breakable Snow). Nasty stuff to ski on, this is a thin crust of iced or wind-packed snow which will not support the skier's weight. A fall on it may result in cuts. If you have to ski on it, select a slope and tromp it down, then devote the day to practicing slow turns or tight christies.

CHAIR LIFT. A motor-driven endless cable slung on towers and carrying chairs hung on it from bars. Each chair carries one skier to the top of the slope, returning empty.

CHRISTIANIA. Speed turns for changing direction, reducing speed, or stopping. They are characterized by body swing. The various types are stem christiania, pure or stop christiania, parallel christiania, open or scissor christiania, pole christiania (all of which see under alphabetical listing).

CHRISTIE, CHRISTY (plural CHRISTIES). Abbreviated form of word christiania; in general use, as opposed to the longer, full name.

CLIMBERS (also called CREEPERS). Strips of plush or sealskin cut to fit the running surface of the skis and held in place by tacky wax and/or straps. The natural lie of the hairs keeps the skier from slipping back when climbing, yet permits him to slide downhill (to some extent) "with the grain." Used mostly for touring, when long climbs are encountered.

COMMA POSITION. A self-explanatory term used to describe the curving of the body in wedeln.

CORN Snow. Snow in separate, ricelike kernels, formed by alternate

melting and freezing at high altitudes. Wonderful to ski on. Encountered mainly in the spring.

CORNICE. Overhanging formation of ice or snow, caused by high winds. It is usually sharp edged, concave on its downhill side, and is dangerous because it may break under your weight or cause avalanches.

COUNTER. Prefix used to refer to the windup preceding a motion or maneuver, as counter-rotation, counterswing, etc.

CREEPERS. A term sometimes erroneously applied to skins or plush (see CLIMBERS) but properly used only of a metal gadget with spikes which fits on boots or under the bindings of skis, thus making it possible to ascend steep, slippery slopes.

D.N.F. Did not finish (in competition).

DIAGONAL TENSION. The downward pull of the cable of the ski binding on the heel of the boot.

DIPSY-DOODLE. A once highly popular skiing method invented and perfected by Dick Durrance.

DOWNHILL. General term indicating a direction rather than a location, and referring to the direction in which the foot of a hill lies. Used in combination with other words, as downhill ski, downhill run, downhill side, etc.

F.I.S. Fédération Intérnationale de Ski, once the world's governing body of the sport.

FALL LINE (also FALLINE). The natural way down a slope — the course a rolling ball would take. On a perfect inclined plane, it would be the shortest straight line from any point on the slope to the bottom.

FIRNSCHNEE. German word for CORN SNOW, q.v.

FLUSH. A series of paired flags set along the fall line, used in SLALOM, q.v.; also arrangements of paired flags in various patterns.

GATE. Two flags of matching color between which slalom racer must ski.

GELANDESPRUNG. In English, TERRAIN JUMP, q.v.

Granular Snow. Old snow in which crystals are large and coarse.

HALF SIDE STEP. Combination of a short SIDE STEP, q.v., with a traversing step, so that each step takes the skier up and forward at the same time.

HERRINGBONE. Direct ascent of a slope by means of toeing out with ski tips and edging on inside edges, which permits climbing without

slipping back. Tails of skis are lifted over each other; poles are used behind skier alternately to brace him and to push him up. Maneuver is named after the herringbone pattern of its tracks.

HOOK. The act or fact of forcefully fanning and edging the tails of the skis to create a take-off platform.

INSIDE. Used of a ski, it refers to the ski on the inside of a turn; used of an edge, it refers to the side of the ski nearest the other ski when both are worn.

JUMP TURN. One or both poles are planted in the snow to the side of the skier, who then leaps into the air and pivots on them. More a trick than a necessary maneuver.

KANONE (plural KANONEN). Expert skier, usually an old-timer.

KICK TURN. A static turn, used to change direction, usually when climbing in traverses. One ski is raised clear of the snow and turned in the new direction; then the other ski is swung around parallel to it.

KILOMETRE LANCÉ. Flying kilometer. From time to time, before the war, at St. Moritz, in Switzerland, competitions were held on this specially prepared downhill course to determine the maximum possible speed on skis. Winner of the last competition was clocked at 85.5 miles per hour over a 600-foot course.

KLISTER. A sticky, blackish, aromatic wax, for very wet snow and warm weather.

LANGLAUF. Cross-country skiing.

LIFT. A device consisting of chairs or bars attached to a motor-driven endless belt, used to carry skiers to the top of a slope.

LINKING (TURNS). Executing a series of turns, in alternate directions, in such a way that the end of one turn is the beginning of the next.

LOWER SKI. The ski on the downhill side of the skier.

Mogul. The very steep-walled and closely grouped hillocks which form on much-skied open slopes.

OPEN CHRISTIANIA. A turn executed by opening the tips of the skis and weighting the inside ski somewhat, to initiate the turn.

OUTSIDE (SKI). The ski on the outside of a turn.

PARALLEL (TURN). Turns executed with the skis parallel throughout the turn are called parallel turns. They are described separately below.

Parallel Christiania. The perfected christie used by experts and in high-speed skiing, slalom, etc. When done rapidly and on a very short radius, it becomes the Stop or Pure Christie, q.v.; when done in

long, sweeping arcs across the fall line, it becomes the Tempo Turn, q.v.

PARALLEL SWING. Literal translation of parallel-schwung, German term for parallel-swing turns.

Passgang. The specialized, rolling gait used by cross-country skiers.

PENALTY. Various amounts of time (in seconds) added to a skier's elapsed time in running a slalom course, imposed for errors in negotiating the gates or pairs of flags. Also, points deducted from a ski jumper's score for poor form or other errors.

PLUSH. See CLIMBERS

POLE CHRISTIANIA. Christie executed with stabilizing aid of one pole planted in the snow; used for quick turning on bad, rutted, or frozen snow.

POWDER SNOW. Dry, cold, fine snow, freshly fallen. Ideal skiing.

PREJUMPING. In high-speed skiing, the art of jumping before reaching the crest of a bump (with a steep downhill face) which would otherwise launch the skier into the air automatically. The prejump shortens the length of flight and, since it is a calculated maneuver, contributes to greater control. (See Figure 80.)

PURE CHRISTIANIA. Short-radius, parallel turn, ending in a full stop. OUERSPRUNG. Ninety-degree jump turn, ending in a full stop.

REVERSE SHOULDER ACTION. Specifically, the act of advancing the inside shoulder in a turn. Generally, the term is applied to a technique of skiing which calls for leading high-speed turns with the inside shoulder. It is "reverse" in the sense that conventional techniques call for the outside shoulder to come forward in turns.

ROTATION. Pivoting of shoulders and body in direction of turn.

RUADE. Literally, "cow-kick." The invention of Emile Allais, this is a technique which employs kicking the tails of the skis up in the air while diving down and forward sharply; during the moment when the virtually unweighted skis are almost entirely off the snow, they are swung left or right, parallel, so that when they fall back to the snow, the skier will have executed a semi-airborne turn.

RÜCKLAGE. Skiing with the weight to the rear of the skis. An unstable stance usually the result of fear and frequently the cause of the spills the skier is afraid of.

SCHUSS. Straight downhill run, with no checking of speed and no turns. SCISSOR CHRISTIANIA. See OPEN CHRISTIANIA.

SEALSKINS. See CLIMBERS.

SHORT SWING. A small-radius parallel turn.

Sideslip. Skis held parallel are allowed to slip sideways down the slope. Releasing edging starts the slip, varying degrees of edging control its speed, full edging stops it.

SIDE STEP (also called STAIR STEP). A sideways ascent up the fall line, with skis at right angles to fall line and kept parallel.

SITZMARK. See BATHTUB.

Ski Tow. Endless motor-driven rope passing over a pulley at top of slope. Skier holds rope and rides it to top of slope.

SLALOM. A downhill race against time through pairs of flags. It is a test of high-speed, precision turning.

SKINS. See CLIMBERS.

SLIP. See SIDESLIP.

SLOPE. Cleared hill reserved for skiers. The part of a hill or mountain which is cleared for skiing.

Snowplow. Equal stemming of both skis with pressure on tails of skis, used for slowing, proceeding slowly, or stopping. Takes its name from the action of the skis when held in the snowplow position, i.e., with tips together and heels spread apart, so that skis form a V.

SNOWPLOW TURN. Elementary turn in which snowplow position is held throughout a turn effected by the weighting of one ski.

STEILHANG. An extremely steep, straight, narrow part of a trail or downhill racing course.

STEM. The placing of one ski at an angle to the direction of motion, by pushing out the heel.

STEM CHRISTIANIA. A turn executed by stemming the downhill ski while counter-rotating, then shifting weight to uphill ski and rotating in direction of turn.

STEM TURN. Lower ski is stemmed, then bears weight while upper ski is stemmed, then weight shift to upper ski and rotation finish the turn.

STEP TURN. A static turn executed by opening the tip of one ski away from the other, then bringing the other ski alongside it; skier can proceed in this way until a full circle is made, step by step.

STOP CHRISTIANIA. See PURE CHRISTIANIA.

SWING. The combination of lift, weight shift, rotation, movement of hands and arms, body and shoulders, which is the distinguishing characteristic of high-speed turns.

SWINGING. Descending a slope in linked swing turns.

SWING TURN. Any turn accomplished with swing.

T-BAR. A type of lift employing a horizontal bar against which the skier leans in order to be drawn up the slope.

TELEMARK. A graceful but unstable turn employing rücklage; difficult to learn, unsuitable to modern ski bindings, largely replaced by stem turn and stem christiania. It is at its most useful in very deep, soft snow, but is not an essential part of the good skier's repertory.

TEMPO TURN. High-speed, long-radius, parallel turn, usually performed in linked swings back and forth across the fall line and close to it.

TERRAIN JUMP. The broad jump of skiing, in which both poles are planted in the snow ahead of the skier, who then jumps, using the poles for height and thrust in order to prolong the jump.

Tow. See Ski Tow.

"TRACK!" The equivalent of "Fore!" in golf. It is meant as a warning to a specific person who is in your line of descent and not as a general announcement to all that you're on your way down. Use it sparingly.

TRAVERSE (DOWNHILL). Descent of a slope on a diagonal instead of straight down the fall line. Traverses linked by turns provide a means of zigzag descent of a slope too steep to schuss.

TRAVERSE (UPHILL). Ascending a hill diagonally, with a walking step, instead of attacking it head on with herringbone or side step. Uphill traverses are linked by kick turns done toward the slope.

UPHILL. General term indicating a direction rather than a location, and referring to the direction in which the summit of a hill or the top of a slope lies. Used in combination with other words, as in uphill ski, uphill side, etc.

VORLAGE. A much misused and misunderstood term. Correctly, it is the maintenance, at all times, of a stance in which the axis of the body is at right angles to the skis. As currently used, it refers to the farfetched leaning forward from the ankles affected by some skiers, which is sometimes carried to such extremes that they hang by their heels from their bindings.

WEDELN. This German word, which describes the wagging of a dog's tail, is now the generic name for a school of skiing based on achieving control and quick maneuvering by a very short and rapid oscillation of the tails of the skis (wagging) while the tips remain in the fall line or in the direction of travel.

WENDIG. A German adjective which means "maneuverability."

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ABOUT THE AUTHORS

FRED ISELIN was born in Glaris, Switzerland. He comes by skiing naturally, his father having been one of the founding fathers of the Swiss national ski organization. While still in his teens, Iselin qualified as a teacher after rigid tests. He has skied professionally in Switzerland, France, Austria, and the United States. As a competitor in downhill and slalom races he has won many prizes. As guide and mountaineer he once worked for a movie company in the capacity of avalanche starter, a delicate job involving going alone to the heights over steep slopes and skiing across them in such a way as to precipitate a slide in the desired place at the desired moment. Tricky work, this.

Iselin has trained racers, run ski schools, taught in New England, Sun Valley, and Aspen, Colorado, taken private groups for ski tours through the Sierras. And it is as a teacher that he has found his true métier. His very great skill coupled with intelligent understanding and insight into the beginner's problems have made him one of the best loved and most respected teachers in the world, despite his youth.

A. C. Spectorsky was born in Paris, France. He was never on skis until he was thirty, but was on typewriter keys far earlier. He is still a tyro at skiing, and as such claims to know more about the trials and tribulations of his fellow tyros than any expert could. He is a trained writer, however, author of The Exurbanites, editor of The Book of the Sea, etc., etc. In college he took his degree in physics and mathematics. It is his knowledge of expository writing, plus his grasp of the physical principles involved in skiing, which make his collaboration with Iselin so successful.

